

The United States MILLER

Published by E. HARRISON CAWKER. { Vol. 12, No. 1. }

MILWAUKEE, NOVEMBER, 1881.

{ Terms: \$1.00 a Year in Advance. Single Copies, 10 Cents. }

Important Notice

For Mills about to purchase Roller Mills. We take this method of informing our friends that we have made arrangements for the exclusive manufacture of the

STEVENS ROLLER MILLS,

UNDER THE PATENTS ISSUED TO JNO. STEVENS.

The work done by the Mills is far superior to that of any other machine known in this country or Europe.

License to use the machine and process will be issued by the patentee for each mill furnished to us.

Old mills, or those with inferior dress, recast with the Stevens dress at reasonable prices.

JOHN T. NOYE & SONS, Buffalo, N. Y.

[Mention this paper when you write us.]

ESTABLISHED 1850.

WILLIAM BRYCE & CO.,

36 MARK LANE,

LONDON (England.)

10 ST. ENCOCH SQUARE,

GLASGOW (Scotland.)

TELEGRAMS:

BRYCE, London or Glasgow.

CONSIGNMENTS OF FLOUR SOLICITED.

BURDETT, JAMES & BRANTH,

Flour Merchants,

BRISTOL, ENGLAND.

[Mention this paper when you write us.]

Patrick Murphy & Son,

FLOUR AND GRAIN

BROKERS & FACTORS,

CORK, IRELAND.

American correspondence solicited.

[Mention this paper when you write us.]

Chamberlain, Pole & Co.,

Brokers & Factors

IN FLOUR,

BRISTOL, ENGLAND.

[Mention this paper when you write us.]

H. G. JANNSEN & CO.,

Commission Merchants,

Amsterdam, Netherlands, Europe.

AMERICAN FLOUR A SPECIALTY.

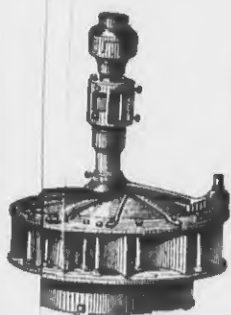
[Mention this paper when you write us.]

GANZ & CO.,

Budapest, Austria-Hungary.

We are the first introducers of the Chilled Iron Rollers for milling purposes, and hold Letters patent for the United States of America. For full particulars address as above.

[Mention this paper when you write us.]



James Leffel's Improved WATER WHEEL.

NEW PRICE LIST FOR 1881.

The "OLD RELIABLE" with Improvements, making it the Most Perfect Turbine now in Use, comprising the Largest and the Smallest Wheels, under both the Highest and Lowest Heads used in this country. Our new Pocket Wheel Book for 1881 and 1882 sent free to those using water power. Address

JAMES LEFFEL & Co., Springfield, Ohio.

and 109 Liberty Street N. Y. City.

[Mention this paper when you write us.]

ROLLS! ROLLS! ROLLS!

For the Entire Reduction of Wheat to Flour.

GRADUAL REDUCTION HAS COME TO STAY.

C. MILLER, of Mansfield, Ohio, representing John T. Noye & Sons, is prepared to furnish Roller Mills complete of any desired capacity.

The Stevens System of Gradual Reduction a Success Everywhere.

Plans furnished when desired. Correspondence Solicited.

C. F. MILLER, Mansfield, Ohio.

GOODYEAR RUBBER CO.

JAMES SUYDAM, Agent.

RUBBER GOODS

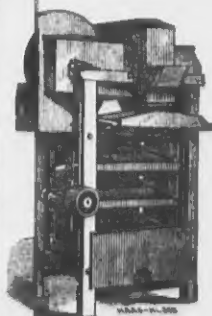
Cape Ann Oil Clothing,

LEATHER { BELTING AND LACING, TABLE AND CARRIAGE } OIL CLOTHS.

372 & 374 East Water St.,

Branch of **GOODYEAR RUBBER CO., NEW YORK.**

MILWAUKEE.



HOWES, BABCOCK, & EWELL.

LATE HOWES, BABCOCK & CO.,

Silver Creek, New York.

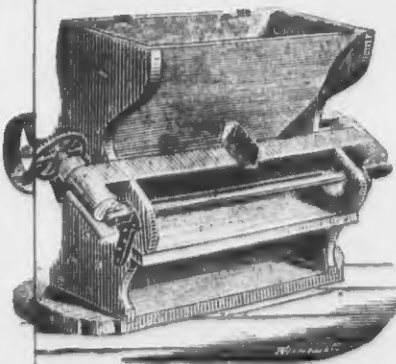
No. 16 Mark Lane, London, Eng.

THOS. TYSON, Melbourne, Victoria,

General Agent for the Australian Colonies and New Zealand.

Sole proprietors and manufacturers of EUREKA Wheat Cleaning Machinery, consisting of "Shut Machines," "Brush Machines," Separators for mills and warehouses, and Flour Packers.

Also the Magnetic Separator for removing substances from grain automatically, and dealers in the genuine Defour & Co. and Dutch Anchor brands Bolting Cloth, and mill furnishings generally.



[Mention this paper when you write us.]

John W. Rogers,

MANUFACTURER AND DRESSER OF

MILL PICKS



313 Cedar St., St. Louis, Mo.

30 or 60 days' trial to any responsible miller in the United States or Canada, and if the picks are not finer and thinner than anything they ever used, there will be no charge for the same, and I will refund all express charges both to and from St. Louis, Mo. When ordering new picks state weight and kind. Send for prices before buying. References from every State and Territory in the United States.

P. S.—No Mill Pick manufacturer who does poor work can get such letters as the following:

Office of James Leffel & Co., Springfield, Ohio.

September 9, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: We herewith inclose draft, \$21.85, to pay your invoice of August 9th. Please acknowledge. Yours respectfully, JAMES LEFFEL & Co.

Office of James Leffel & Co., Springfield, Ohio.

November 6, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: Enclosed find bill of lading covering a shipment of mill picks made to-day. Please check the blades on one end and return to us at your very earliest convenience. The last lot of blades sent are giving good satisfaction. Yours truly, JAMES LEFFEL & Co.

Office of the Williams & Orton Mill Works,

Sterling, Ill., October 7th, 1880.

John W. Rogers, Esq., St. Louis, Mo.—Dear Sir: Inclosed find Chicago draft No. 85,000, amount \$11.00, in full account. Please acknowledge receipt and oblige. Yours respectfully, WILLIAMS & ORTON MILL CO., G. M. Robinson, Secretary.

The Norrlycke & Marnon Mill Works,

Indianapolis, Ind., September 10, 1880.

John W. Rogers, St. Louis, Mo.—Dear Sir: We inclose our New York check No. 334 for \$72.25, in full of our account. You will please acknowledge receipt of same, and oblige. Yours respectfully, NORRLYCKE & MARNON CO.

Also Mills, Southey, Ill.

John W. Rogers, St. Louis, Mo.—Gents: Please find enclosed order on F. C. Taylor & Co., St. Louis, in pay for the Mill Picks, with thanks for your liberal offer to try which we have done, and take pleasure in saying that we find them a superior Pick to any we have had from Chicago or St. Louis, and will add that I have had 45 years' experience in milling. J. J. HAYCRAFT.

[Mention this paper when you write us.]

JOHN C. HIGGINS,

Manufacturer and Dresser of

Mill Picks,

No. 169 W. Kinzie Street,
CHICAGO, - ILLINOIS.



Picks will be sent on 30 or 60 days' trial to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada. Send for Circular and Price List.

[Mention this paper when you write us.]

The "Nonpareil" Mill Pick Company.

Manufacturers and Dressers of

MILL PICKS.



We use the best quality of double-refined English Cast Steel. We have had thirty years' experience and guarantee satisfaction. Our product speaks for itself. Our picks are equal in quality to any made, and are excelled by none. Can furnish testimonials by the hundreds from millers in all parts of the country. To responsible parties we give thirty days' trial, and if we do not give entire satisfaction we will pay express charges to and from Chicago. Send for our latest Circular and Reduced Price List to

O'CONNELL & MAHONEY,

3 Dunn Street, CHICAGO, ILL.

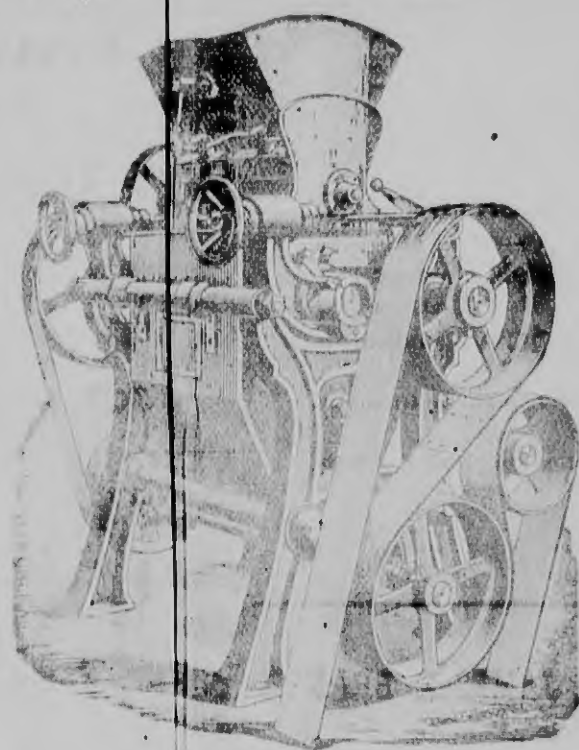
[Mention this paper when you write us.]

GRAY'S PATENT NOISELESS ROLLER



DOUBLE MACHINE.

SALES



SINGLE MACHINE.

WITH

CORRUGATED CHILLED IRON ROLLS.

CORRUGATIONS CUT OF ALL DESCRIPTIONS.

OVER 5,000 IN USE.

First Premium Awarded at Millers' International Exhibition.

These Machines require little power, are perfectly noiseless, being driven entirely by belt, are simple in construction; strong and durable; perfect in every adjustment; adapted to both soft and hard wheats.

We refer to the following prominent millers who are each using from 50 to 150 of the machines:

Winona Mill Co., Winona, Minn.
C. A. Pillsbury & Co. Minneapolis, Minn.
C. C. Washburn.
Washburn, Crosby & Co., "
W. D. Washburn & Co., "
Sibley, Fletcher, Holmes & Co., "
E. M. White & Co., "
John Glenn, Glasgow, Scotland.
Jones & Co., New York City.
Geo. V. Hecker, New York City.
Becker & Underwood, Dixon, Ill.
Schurmeier & Smith, St. Paul, Minn.
E. T. Archibald & Co., Dundas, Minn.

Jesse Ames' Sons, Northfield, Minn.
J. B. A. Kern, Milwaukee, Wis.
Edw. Sanderson, "
Daisy Roller Mill, "
C. E. Manegold & Sons, Milwaukee, Wis.
Commins & Allen, Akron, Ohio.
L. H. Gibson & Co., Indianapolis, Ind.
L. H. Lanier & Co., Nashville, Tenn.
LaGrange Mill Co., Red Wing, Minn.
Waggoner & Gat, Independence, Mo.
Horace Davis & Co., San Francisco, Cal.
And Hundreds of others.

To all parties purchasing our Rolls we give full information regarding the system of Roller Milling.

ADDRESS:

EDW. P. ALLIS & CO.,

Mention this Paper when you write us.

MILWAUKEE, WIS.

The United States MILLER

Published by
E. HARRISON SAWYER. { Vol. 12, No. 1 }

MILWAUKEE, NOVEMBER, 1881.

{ Terms: \$1.00 a Year in Advance.
Single Copies, 10 Cents. }

The Pillsbury "A" Mill at Minneapolis.

We have the pleasure of presenting to our readers herewith an illustration and description of the Pillsbury "A" mill, in Minneapolis, Minn. This is the largest flour mill in the world and is able to produce sufficient flour to feed a great city like New York. Mr. C. A. Pillsbury, of the firm of Chas. A. Pillsbury & Co., proprietors of the "A" mill and four others in Minneapolis has been identified with the milling interests of Minneapolis since 1869, and has adopted the most improved and best adapted machinery and processes to be found in America or Europe in the mill here described. Immediately after Mr. Pillsbury returned from a business visit to Europe in 1880, the general plan of the structure was agreed upon and the site was selected on the east side of the river about 150 yards below the Falls of St. Anthony. The ground was broken and the building commenced in the early spring of 1880 from plans drawn by L. S. Buffington, of Minneapolis.

The structure is built of Trenton limestone, rock faced and laid in courses. Its length is 180 feet, its width 115 feet, and the height 137 feet, divided into seven stories and cupola. The foundation side walls are eight feet and a half thick, and the end walls seven feet and a half. The walls taper from a thickness of five and a half feet below the grinding floor to a thickness of two and a half feet in the three highest stories. The basement story, which is twenty feet high, is laid in Louisville cement, and the coping, window sills and two belting courses are of hammer dressed granite. The words "Pillsbury A" are of marble, the letters in "Pillsbury" being four feet high and the "A" ten feet. It took 125 men six months to construct the masonry.

The forebay, in the basement, is 125 feet long and 15 feet wide, built of stone laid in hydraulic cement. The wheel-pits were dug in the solid rock, are 53 feet deep and walled in. The iron pits, inside the flumes, are 12 feet in diameter. They are made of 3/4 inch boiler iron. Two 55 inch Victor turbines made by the Stilwell & Bierce Manufacturing Co., of Dayton, O., furnish 240 horse-power, which is the largest yield of power ever yet given by two wheels. Water is led to the mill by a canal 650 feet long, 16 wide and 16 deep dug in the solid rock and afterwards walled. The bulkhead is 30 feet by 80, containing two gates, one on each side of the central pier. A stone arch beneath the basement admits the water to the mill. The canal cost \$100,000. The discharge from the wheels is by means of two tunnels, each 150 feet long, running from the river to the mill, directly under the wheels, and the tunnels empty into a tail race, several hundred feet long which empties into the river.

A bevel gear at the top of each water-wheel shaft transmits the power to a horizontal shaft eight inches in diameter, 145 feet long, tapering to six inches at the end, which rests on a solid arch work of masonry inside of the forebay. On this line-shaft are the driving pulleys, each weighing 8 1/2 tons, on which run two 48-inch double belts, each 126 feet long. From the line-shaft the power is taken by 30-inch belts to drive the different machinery in the mill. The power at present is taken from but one of these shafts, as the mill is really a double mill and only one-half is now in operation.

From this shaft one 30-inch double belt drives the bolting and elevating machinery; two similar belts drive the rolls and purifiers; a third drives the cleaning machinery and an-

other drives the electric machine which requires from twelve to fifteen horse power. The mill is so arranged that if one wheel breaks, the other wheel can run the whole mill, or the power of both wheels can be used together on each or both sides.

In addition to the driving mechanism which is found on the first or basement floor, there is also a wheat bin capable of holding 35,000 bushels of wheat, extending up through the grinding floor. Here are also the hurst frames for the millstone on the floor above. The second story is the reducing floor, and here when the mill is completed there will be over 400 sets of roller mills arranged in twelve lines. As stated above, only half of the machinery has been placed. So far 101 Gray Roller Mills have been furnished by E. P. Allis & Co., of Milwaukee, Wis. All of these machines are double, with rollers 9x18 inches in size; and comprise 64 corrugated machines, 27 smooth roller machines, and 10 porcelain machines. There are 125 of Stevens' Roller Mills furnished by Jno. T. Noye & Sons, of Buffalo, N. Y. There will be twenty pairs of millstones in the whole mill, which will be

each 14 feet long. On this floor there are 23 No. 2 Smith Purifiers, furnished by the Geo. T. Smith Purifier Co., of Jackson, Mich. Besides this machinery, there are bins over the flour packers on the floor below, made out of boiler iron six feet in diameter and extending through two stories. In the end of this story set apart for wheat cleaning, like the floor below, there are four Richmond Brush Machines, furnished by the Richmond Manufacturing Co., of Lockport, N. Y., and two large size Kurth Coggle Separators, furnished by the Coggle Separator Manufacturing Co., of Milwaukee. On this floor there are also four Niagara Bran Dusters, furnished by the Richmond Manufacturing Co., of Lockport, N. Y.

On the fifth floor, besides the continuation of the bolting chests, there are four Richmond Brush Machines, four Barnard & Leas Separators, and two centrifugal flour bolts.

On the sixth floor there are four centrifugal flour bolts, furnished by John Fiechter, Son & Co., of Minneapolis; four Niagara Bran Dusters, four Victor Smutters, furnished by the Barnard & Leas Manufacturing Co., and four Richmond Brush Machines. The continuation

Paul, and the Chicago, St. Paul, Minneapolis & Omaha railways. The facilities are such that eight cars of wheat per hour can easily be unloaded. As feeders to the "Pillsbury Mills" may be counted thirty-six elevators in different parts of the state, operated by Messrs. Pillsbury & Hurlbut, and having an aggregate capacity of 2,173,000 bushels. The capital invested in conducting this part of the business will readily be seen to be immense.

The mill is supplied with an elevator for passengers and freight, and is lighted with a Brush electric light, of 32,000 candle power. Steam for heating the building is supplied by two steel boilers placed in a fire-proof building separate from the mill. Electric call bells are on every floor, and the mill has telephone connection with Minneapolis, St. Paul, and Stillwater. Among other features of the mill may be noticed, is the central stairway, which is spiral, and is built of iron. The interior of the mill is painted white, with red trimmings, while the roller mills, stairways and scales are also red.

The half of the mill now completed is capable of turning out over 2,500 barrels per day, having recently made 47 barrels more than that amount. This will give the completed mill a capacity of 5,000 barrels per day, making it the largest mill in the world."



THE PILLSBURY "A" MILL AT MINNEAPOLIS.

used on middlings. The millstones are arranged in one line along the north wall of this story and are handsomely fitted up in black walnut and ash, and are all provided with Behns' Patent High Pressure Millstone Ventilation, furnished by Brehmer Bros., of Philadelphia. On this floor there is a weighing hopper and scales, the hopper holding 800 bushels, and a line shaft 120 feet long, from which power is transmitted to drive the flour packers on the floor above.

The third floor is the packing-room where, on each side of the mill, will be placed when the second half of the mill is finished, twelve Eureka Flour Packers, making twenty-four in all, furnished by the Barnard & Leas Manufacturing Co., of Moline, Ill. One end of this floor is partitioned off for a cleaning room, deriving its power from a separate belt. The greater part of this floor is taken up with storage bins; and plenty of room is left for handling the flour after it is packed.

On the fourth floor the bolting chests begin and run up to the attic. In the eastern half of the mill now running, there are eight double and four single chests, which on the three floors above contain 40 reels each, and on the fourth floor above 22 reels, making 142 reels in all,

of the bolting chests extends through this story and the next, and on all these floors are more Smith Purifiers, making 100 in all. When the whole mill is completed it will contain 200 of these machines. The Hardenbergh Dust Catcher is used on the purifiers.

On the seventh floor are three lines of shafting from which are driven the elevators and bolts. The wheat cleaning machinery of the mill was furnished by the Barnard & Leas Manufacturing Co., of Moline, Ill., the Richmond Manufacturing Co., of Lockport, N. Y., and the Coggle Separator Co., of Milwaukee.

Mr. W. F. Gunn, of Gunn, Cross & Co., Minneapolis, furnished the plans for the mill, which were made under his direct supervision, and he also acted as superintending millwright of the mill. The Pray Manufacturing Co., of Minneapolis, furnished the machinery. The mill has the most ample facilities for receiving grain and shipping flour. Indeed, this is absolutely necessary, when we consider that the mill, when the western half is completed, will use 25,000 bushels of wheat every day it runs. There are two tracks in front and three in the rear of the mill, affording connection with the St. Paul, Minneapolis & Manitoba, the Chicago, Milwaukee & St.

fire-arm that he was anxious to patent. When he obtained his patrimony he went to France to improve his implement. His was the experience of nearly all inventors. His money was soon exhausted, and at times he was reduced to the greatest extremity. But he never lost faith in his rifle. Finally he interested some capitalist, and the implement was carried to perfection. In due time the French government was induced to adopt the repeater for the army. The British government has just done the same thing, and the Toledo inventor is prepared to roll in wealth. His arm is said to be the most magnificent repeating rifle in the world.

A mill pick maker advises that in grinding picks the pressure be not too great, and that sufficient water be used so that heating, which always injures the temper, be prevented. It should be borne in mind that cracking picks should not be used for furrowing, and no pick should be used after its edges are worn too blunt. When picks are blunt grind them to a straight bevel, one-eighth or three eighths long.

President Garfield's picture is to be placed upon the five cent international postal letter stamp. A fine engraving for the new stamp is being executed for that purpose by the bank note engraving company.

SPROUTED WHEAT.—Professor Beal, of the Michigan Agricultural College, has made some experiments to ascertain whether wheat well dried after once germinating, would germinate again. In case of wheat, the plumule lived and continued the growth, if any growth was made, but the roots always died when well dried. If any growth was made a second or third time, new roots started out. Of fifty kernels of unknown white wheat once germinated a little and dried, 96 per cent. germinated; twice dried, 88 per cent. Of fifty kernels once germinated till the plumule became half an inch long and the roots an inch or two inches, then dried, 82 per cent. germinated; twice sprouted and twice dried, 48 per cent. Of fifty kernels once germinated till the plumule became one inch long and the roots one to two inches, then dried, 38 per cent. germinated; twice sprouted and twice dried, 14 per cent. again germinated. Subsequent experiments with new wheat showed still more favorable results.

AN INVENTOR'S TRIUMPH.—A few years ago a young man named Gardener, living at Toledo, O., inherited some money from his father. He had been tinkering around from boyhood with a

UNITED STATES MILLER.

PUBLISHED MONTHLY.
OFFICE NO. 118 GRAND AVENUE, MILWAUKEE, WIS.
Subscription Price.....\$1 per year in advance.
Foreign Subscription.....\$1.50 per year in advance.

ANNOUNCEMENT.

WM. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLING & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

MILWAUKEE, NOVEMBER, 1881.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year.

SINCE the Bostonians have about given up the World's Fair enterprise the New Yorkers are again talking seriously of reorganizing and carrying out the project.

A KANSAS farmer who claims to have tried it says that salt sprinkled on ground sowed with wheat at the rate of a half bushel to the acre will prevent the ravages of chinch bugs.

Dr. SAMUEL SEXTON, of Philadelphia, after years of observation and experiment has expressed the opinion that defective teeth are very often the cause of deafness and troubles of the eyes in children.

MARRIED—September 29, 1881, at Chicago, Ill., Mr. D. H. Ranck, editor of the *Millstone* of Indianapolis, Ind., to Miss Alice Rowley, daughter of C. M. Rowley, Esq., of Chicago. We congratulate Bro. Ranck on his good fortune and wish him and his bride a life of happiness and prosperity.

TIMELY AND EXCELLENT.—We have received from H. H. Warner & Co., of Rochester, N. Y., Safe Kidney and Liver Cure manufacturers, a handsome large, colored lithograph of the late "President Garfield and Cabinet," to the inspection of which we cordially invite our subscribers. It is a fine picture and well worth preservation.

PIPE-LINES for conveying oil have been in use for some time, and now one for conveying the brine from East Tawas, Mich., to Oscoda, is being built, and will be shortly completed. The pipe is of 9 inch bore, is laid 3 feet under ground, and will be 12½ miles long. It will convey enough brine to make 2,000 barrels of salt per day.

ELECTRICITY has been applied for the transmission of power in a French mine. By this means a ventilating fan 2.63 feet in diameter was propelled 1640 feet below the surface, the power being transmitted from an engine above ground. Two Gramme dynamo-electric machines were used. This is said to be the first time electricity for transmitting power for practical use has been employed.

MARRIED.—Wednesday, September 28, 1881 at La Crosse, Wis., Charles M. Palmer, business manager and assistant editor of the *Northwestern Miller* of Minneapolis, to Miss Mamie Sill, daughter of Hon. W. R. Sill of La Crosse, Wis. The ceremony took place in Christ Church, La Crosse, in the presence of a throng of friends of the contracting parties. We wish the couple a long life of unalloyed happiness.

THE Agricultural Returns show that the total acreage of the United Kingdom of Great Britain, including the Channel Islands and the Isle of Man, is 77,828,948, of which 47,586,700 are returned as under "crops, bare fallow, and grass." The corn crops cover 10,672,086 acres, the green crops 4,746,298. Clover and grass under rotation amount to 6,889,225 acres, and the permanent pasture, exclusive of heath or mountain land is not less than 24,717,092 acres. Orchards have 180,000, and market 44,000. 2,409,000 acres are devoted to woods and plantations. In the

ten years between 1870 and 1880, nearly 591,000 acres have ceased to be used for wheat growing. In the same period there has been an increase of nearly two and a half millions of permanent pasture.

Our sanctum was illuminated for a brief half hour during the early part of October by the presence of Clifford F. Hall, editor of the *Grain Cleaner*, of Moline, Ill. We are gratified to make Brother Hall's acquaintance and hope he may soon be able to make us and our fair city a longer visit. Mr. Hall has but recently become a member of the milling editorial fraternity but he shows great aptness for the field he has dared to enter.

MESSRS. SECK BROS., of Bockenheim, Germany, are meeting with considerable success in introducing their roller-mills, granulating and scalping machines, and other milling machinery in Great Britain. This firm is known as being the pioneer in automatic roller milling in Belgium and France, where they erected the first Belgian roller mill, at Tournai, and are just now, besides others, fitting up a large roller mill at Roubaix, France, and their system seems to be also making progress in this country, as quite a number of their machines have been imported by American millers.

BRADSTREET'S *Commercial Agency* reports the total number of failures in the United States for the nine months ending September 30 at 4,387 with liabilities amounting to \$47,700,494. Canadian failures for the same period were 459 in number with liabilities of \$5,172,207.

DUN'S *Commercial Agency*, reports the total number of failures in the United States for the 9 months ending Sept. 30 at 3890 with liabilities of \$51,059,010 and Canada for the same period with 479 failures with liabilities amounting to \$5,880,511. An exceptionally good condition of commercial affairs is reported in Canada.

The Soy or Soya Bean.

The Soy bean a native of Japan and China has been successfully introduced in various portions of Europe and has been pronounced by good judges to be superior to ordinary grains for feeding cattle. The Chinese who cultivate it extensively make a kind of cheese and various excellent dishes from it for table use. The roasted seeds make a good substitute for coffee. M. Roman a well-known French savant says that the cultivation of this plant has greatly increased in Hungary, France and Italy in late years and thinks it will pay better than potatoes. The beans sell for 12 cents per pound in London. We think it would be well for American farmers to introduce the Soy beans as they would undoubtedly grow well in this country.

Sacks Instead of Barrels for Flour for the New England Trade.

Sacks have already taken the place of barrels in the export trade to a very great extent, and give entire satisfaction to all parties concerned, and in local trade paper sacks for flour are used very extensively, but the New England trade so far has demanded the old fashioned wooden flour barrel. Barrels are yearly increasing in price, both from the enhanced value of the material used in their construction, and from the very high price asked by coopers for making them. We have conversed with several well-known millers on the subject, and they all earnestly hope that the New Englanders will soon be satisfied with sacks instead of barrels. They believe when they have become accustomed to it that they will prefer the sacks, as an empty sack is always useful, and when not in use occupies but little room, while the flour barrels, as soon as emptied, are, in nine cases out of ten, converted into kindling wood. A prominent Eastern dealer says that the matter is almost entirely in the

hands of the Western millers, and that if a dozen of the large mills in Minnesota and Wisconsin that have a large New England trade would refuse to ship in barrels, that it would be but a short time before sacked flour would be accepted without a murmur. We would like to hear from millers and Eastern flour dealers on this subject, and if the matter is thoroughly discussed in the press it may lead to an important change in the trade in a very short time.

Patent Corn Malt for English Brewers.

English brewers have for some time been using roasted corn (maize) malt for coloring purposes. A Dublin firm (Messrs. Plunkett & Co.) are engaged in the preparation of this article, and find but little difficulty in selling it to take the place of roasted barley malt on account of its comparative cheapness. Formerly some difficulty was experienced in crushing or grinding it, but the manufacturers have overcome all troubles and now furnish it to brewers either granulated or finely powdered. Corn is used to a considerable extent now by American and foreign brewers.

A series of letters on Milling written expressly for the UNITED STATES MILLER.

Birkholz on Milling.

BY R. BIRKHOLZ, M. E.

No. I.

Nine years ago the millwright, laying out the plans for a new mill, had a great deal easier job than he has to-day. After the outlines of the building were drawn, the stones were located in the most convenient place, twelve feet off the line shaft—the quarter-twists, tighteners, husk frames and spindles all went on paper "lik' lightning," as if made by a templet—the bolting chests were placed in upper stories, a few elevators added, and the great deed was done. Oh, wonderful time! Why is it gone? Why could we not have ended our existence as mill designers, before the present epoch, and have retired upon our laurels already won? If we millwrights could have gone out of business nine years ago, we would have tried to make an honest living during this period of gradual revolution, complication and conglomeration, by cutting coupons. But we did not have the right kind of shears to do the cutting with, and as patient as lambs being driven to the shambles, we were compelled to move on with the spirit of the times.

First came the news that more lucrative milling could be done by not grinding the wheat all down at once, but by two grindings; and in connection with that idea the middlings purifier became known, was introduced and found to be an absolute necessity. Then the designing millwright had to place them in addition to bolting reels, and provide for more elevators. Some stones were grinding wheat, some middlings, some tailings, and some were regrinding the bran—and all needed elevators and conveyers, and more reels and spouts became necessary. A grinding diagram, although simple in comparison with the ones of to-day, was required.

Later, rolls were introduced. First, smooth ones for cleaning the wheat, thereby opening the berries, (degerminating them in a measure) and the dirt flour having lodged in the crease was eliminated by rolling wire screens before the wheat was entered in the stones. Subsequently rolls were used for grinding tailings, then smooth iron rolls were tried for grinding out bran, then porcelain rolls were used for the same purpose, and also to grind tailings and middlings with. The wheat was ground and separated into its component parts, which again were treated separately on either purifiers, rolls, or stones, thus rendering the milling diagram—the illustrated *modus operandi*—the guide of the designing millwright still more complicated and hard to construe.

Then the first corrugated iron rolls came into use. They were used at first exclusively for cleaning bran, but only for a short time, when at once, the system of gradual reduction or corrugated iron rolls was introduced, and called for. Now and then some mill owners or experts tried to prove that five or six reductions could be made with far better results with a system of six pairs of stones, grinding wheat very high on the first run of stones—bolting off the flour and middlings—reducing the tailings off the scalping reel on the second stone, and so on.

Some one thought he had "struck it rich" when he used smooth rolls for first or last re-

duction, or ground his bran out on stone, making actually his sixth or last reduction on stone. Some got up mills on the coffee-mill plan, to effect the gradual reduction of wheat, some knocked the wheat to atoms by passing it in between disks provided with intercepting steel pins. All these inventors strove to decrease the production of flour during the granulation process, and to use little power and save a large outlay of money. In many cases these accomplishments have been illusive, the manufacturers of the machines being the only ones profiting materially by their sales.

Meantime, the middlings were ground by some millers with great economy, on porcelain rolls, by others on smooth iron rolls, and still by others on stones. First, second, third, fourth, hard, soft, coarse, firm, dusty middlings—first and second returns—first, second and third, low grade stuff—all were terms or expressions which sprang into existence by the mode of grinding for percentage—that is, grinding the stuff over and over again lightly, like the boy eating sandy currants. When his gums got sore from having already masticated a considerable quantity, he was asked why he made up such a face and chewed so carefully. He replied that he was "working on the high grinding plan, which was a slow but a good one."

In some instances, millers reduced their coarse middlings four to six times, always squeezing them lightly and then bolting off, overdoing their work undoubtedly.

The time of gradual revolution has now passed its climax, for which we should feel thankful. Milling experts need no longer talk themselves hoarse in demonstrating the superiority of rolls. The system speaks for itself, and the millers of the United States are progressing more rapidly than in any other country. They do not mind the expense of visiting other mills, to see how the roller system is working, and to study its results. Rolls are undoubtedly a success, but the builders of roller mills and milling machinery want a further chance to "feel" in the pockets of millers; they want their harvest time to last as long as possible. They are now brooding over new constructions of roller mills, stone rolls, purifiers, dust rooms, centrifugal flour reels, etc.

Millers of this glorious Republic, you have a friend in every one of them; every one is trying hard to better your condition. It is not entirely your money that they are seeking. When one tells you that his machine is the best, use your own judgment, for he only wants to benefit you. The world moves, and it takes money to keep up with the times. It is the miller's money that pays for the experiments, and after a while he may get a perfect machine, which in its more embryotic state was sold to him a short time ago for about the same price. It is remarkable how complicated the roller mills begin to look. They begin to be a collection of adjustments with some rollers laid in. They begin to look like a soldier on dress parade, covered with gold lace and gilt buttons. Adjustments are needed, I admit, but they should be concealed, and make as little show as possible. Plainness is a merit. The constructing experts of the world seem to be all let loose on milling implements, and we are reminded of the old saying, "too many cooks spoil the broth." Corrugating machines and roller grinding machines will, I predict, be soon upon the market. They will be useful machines for millers, as the rolls in many places are already becoming rather dull, and not round. A cheap machine for corrugating and grinding will meet with a brisk demand. But then, the millers using dull rolls to grind with, do not have use for a corrugating machine. Oh, no; they will make their "high percentage" of "patent" flour right along, in spite of corrugating tools—perhaps they might get too sharp, and need dulling.

Coming back to the work of the designing millwright of to-day—he indeed has hard work of it earning his livelihood for the most economical work is demanded by the enterprising miller—the higher percentage of good flour he wants to produce, the more intricate the milling diagram becomes, and even the plan of the mill itself.

The building is generally full of rolls, reels, conveyers, elevators and other machinery, and the discovery that there is "room for one more" is the only refreshing consolation and stimulant for the mill designer, and he often wonders himself when he has completed his work how he did get all the machinery placed. A perfect mass of spouts run through the different apartments to the infinite disgust of corpulent millers.

The head millers of to-day have passed their

palmiest days. Now they have a multitude of spouts, elevators, reels, etc., etc., to keep in mind; the grinding being done differently, they have now to look after 15 to 20 different stuffs where before they had but two or three.

These aggregations of incumbering machinery referred to are noticed mostly in mills where competitors demand the *increase of percentage*. For mills grinding little or no export flour, but depending on local trade, or mills in the far west or south, it would not pay to have them furnished with such complicated machinery and such an intricate system of handling the products. It really seems as if mill construction has been carried to unwarrantable extremes and a cry is being heard from all parts of the country for simplification of roller-mills, milling machinery in general, and especially of the internal milling arrangements.

In Budapest, Hungary, roller mills are now being built, cheaply and efficaciously, and every means is being employed to simplify milling for the benefit of the smaller millers who cannot afford to make such numerous divisions of their products.

The *Ungarische Mueller Zeitung*, of Sept. 1, 1881, has an article on the subject of "Low Grinding Roller-mills," of which the following is a liberal translation:

"As long as Ganz & Co. (of Budapest, Austria-Hungary) have been engaged in building roller-mills, every year shows improvements they have made upon them. Last year they placed on the market a low-grinding roller-mill, having two sets of rolls, in pairs above each other, each set being driven by a separate belt. This machine has met with an astonishingly large sale to the owners of small mills, who are naturally opposed to incurring great expenses in changing their mills. The excellent resulting products, the economy of room and power, such important items to the small mill owner, proved that it paid to purchase these low-grinding roller-mills, and to-day we find them in almost every small mill in Hungary. This year, Messrs. Ganz & Co. have placed upon the market three more improved roller-mills—the low-grinding roller machine No. 21, the portable complete low-grinding roller-mill and the Buchholz-Mechwart low-grinding roller-machine. In the low-grinding roller-mill No. 21, the upper pair of rolls reduces the wheat almost completely; (the product is of course scalped) the tailings are passed to the lower set of rolls in the machine and here the bran is ground out and finished. The machine is eminently fit for working on rye and still better for corn. When we discover the great amount of power consumed by a millstone grinding corn, it is surprising indeed to the miller to find how much easier and better this work is done by this machine. There is hardly any corn flour produced that would not pass through No. 8 silk. The meal is elegant. The rolls require from 4½ to 5 horse-power and grind easily 500 to 600 pounds of corn per hour.

Ganz & Co.'s portable roller-mill is built on the platform of a heavy wagon so constructed that it can move easily on the common highways. A speculative miller may drive this portable mill around to the farmers, grind their wheat at their doors and thus save them the trouble of carting their grain to mill and the product back again. The mill itself consists of a low-grinding roller-mill (No. 21) a corrugated roller-mill (No. 11 a) a centrifugal reel and three elevators, booting below platform. The corn, wheat or rye to be ground is emptied into a hopper connected with one elevator, by which it is thrown either into roll No. 21 or No. 11 a. The product of No. 21 is taken up by a second elevator emptying either into centrifugal reel or if Graham flour is wanted, into a flour box. The product of rolls 11 a is elevated into a second flour box from which it can be filled into sacks." (Translator's remark. I must say that the above description seems rather mixed, for I cannot understand why two heavy roller-mills are placed on the wagon when one is enough. In this country we would have one roller-mill with two pairs of rolls and two small centrifugal reels, taking tailings into second pair, bolt second break and tail off the bran.)

The Low-grinding Buchholz-Mechwart Patent roller-machine has met with a rapid sale in England and Germany. This machine contains three corrugated rolls and is built like the famous Ring-Roller-mill. The upper and middle rolls combined, effect the first reduction—the product drops on shaker sieves which are kept clean by a traveling brush. The machine is noiseless and does not shake the mill like the Buchholz-Mechwart high-grinding roller-mill is likely to do, judging by the illustrations and descriptions I have seen.

In a late number of the *Ungar. Mueller Zeitung* I find a report of the Portable roller-mill described heretofore. The mill was driven by a portable six or seven horse-power engine. The report says:

"We have to add to our former description that the sides of the wagon are made to lower down to level, forming an enlarged grinding floor. The double roller-mill No. 21 ground wheat at first until about 11 o'clock; then rye. The roll 11 a first ground wheat and afterward corn. The product of No. 21 passed into centrifugal reel, which delivered, including bran, five sorts of flour of which

the one, taken off near the head, could be called very fine flour."

Now, in regard to building well-paying mills in this country on the new process, spending as little money thereon as possible, it would be advisable to proceed as I shall hereafter describe.

TO BE CONTINUED IN DECEMBER NUMBER.

Flour and Grain Trade Notes.

From 3,000 written answers in response to inquiries sent out, *Bradstreet* estimates the wheat output in the United States for 1881 as follows:

	Bushels.
Western states.....	248,137,000
Pacific coast.....	33,325,000
Colorado and territories.....	19,000,000
New England.....	1,000,000
Middle states.....	34,500,000
Southern states.....	40,000,000
Total.....	368,992,000

Bradstreet also gives the following figures on the corn crop of 1881:

	Bushels.
Western states.....	869,241,000
Southern states.....	247,500,000
Middle states.....	62,400,000
New England states.....	7,000,000
Pacific coast.....	2,500,000
Territories.....	5,000,000
Total.....	1,193,641,000

The above table indicates that the corn crop of the United States for 1881 is short about one-third of the yield, which it was reasonable to expect.

Recent Inventions.

Edgar H. and C. Morgan were granted a patent, Sept. 27, for a feed grinding mill.

James Nolan, of Scranton, Pa., has patented an improved floating grain and coal elevator.

Cornelius S. Hoover, of Lancaster, Pa., has taken out another patent for a millstone dressing machine.

A patent was issued Sept. 27 to Charles R. Fiesler, of Chicago, for an improved elevator bucket.

Christian Abele, of New York City, was granted a patent October 4th, for an improved portable grain grinding mill.

The successful operation of a new machine for extracting ramie fibre, is announced by New Orleans papers.

John W. Frederick, of Indianapolis, Ind., has secured a patent for a press for compressing bran, etc., into bales for shipment.

Edward R. Burns, of Indianapolis, Ind., patented a hominy mill October 4th. He has assigned a half interest to S. Davis & Co.

Charles Kaestner has recently patented an elevating apparatus for mills, elevators, etc., which is said to be a very valuable invention.

September 27, patents were granted to S. C. Schofield, of Freeport, Ill., for a corn sheller, and to Adam Schultz, of Cincinnati, O., for a grain cleaning machine.

W. D. Gray, M. E., of Milwaukee, has recently patented a new feeding device for roller mills which is very simple and yet guarantees a positive even feed and is especially useful in feeding bran and soft stuffs to the rollers.

An improvement in steam grain driers has been patented by Mr. Henry Cutler, of North Wilbraham, Mass. The invention consists in a shaft made hollow at one end to receive the inlet steam, and with perforations at the other end to discharge the water of condensation, the head cast in one piece with one or more chambers, receiving steam through the conduction pipes connected with the cavity of the shaft and distributing the steam to the circulation pipes forming the heating surfaces, the return bends connecting the circulation pipes in pairs to induce circulation.

The Louisiana Sugar Bowl describes an invention operating upon an entirely new principle in rice-milling. This invention, according to the journal in question, consists in substituting for the vertical movement in common use, whereby rice is decorticated by a species of pounding, a rotary motion under which the grains of rough rice are decorticated and polished through simple friction with each other. The object sought is to avoid the breakage of grains and the pulverization of the husks which has cost so much time in winnowing, and separation of the broken from unbroken grains. It is claimed for this invention that it will convert in a short

time the rough rice into polished rice, in which comparatively few broken grains are found, and expels the husks equally unbroken.

A PATENT to utilize sawdust has been granted to W. Grossman, of Petersburg, Va., to make railroad ties, fence posts, paving and building blocks, etc. This artificial wood, it is claimed, can be made fire and waterproof, and no insect will attack it. It will take polish, and will stand higher pressure than ordinary wood. It also can be cut and sawed, and allow nails to be driven into it. As the process of making it is very simple and cheap, it may be destined to bring a revolution in the sawmill business; at least it will relieve the sawmill men of much trouble concerning the accumulation of sawdust.

Wheat Countries—Crops and Consumption.

Wheat is raised in nearly all parts of the world. While most wheat-growing countries ordinarily produce enough for home wants, few have a surplus for export. The United States is the largest wheat producing, wheat consuming, and wheat exporting country in the world. It has yielded as high as 480,000,000 bushels. Allowing five bushels per capita for consumption, this would leave 280,000,000 bushels for export, less the amount required for seed. During the fiscal year ending June 30, 1880, the United States exported 158,752,800 bushels wheat and 6,011,400 barrels wheat flour. This flour was equal to 30,570,000 bushels wheat, and added to the wheat gives a total of 188,809,800 bushels. We have not the figures at hand for the last fiscal year, but they were probably nearer 200,000,000 bushels. California raised at least one-ninth of the wheat produced in the United States in 1880.

Of foreign countries, France leads with a crop of 300,000,000 bushels in good years. France is, therefore, generally relied upon to supply less favored countries, and in some years can spare 100,000,000 bushels for export. Russia follows hard upon France, and has yielded as much as 240,000,000 bushels. Germany, Spain, Italy, Austria-Hungary, and the United Kingdom are the next heaviest producers. The maximum crop in these countries is about the same, and may be stated at from 10,000,000 to 120,000,000 bushels per annum. Most of these countries import more or less wheat, and the United Kingdom is invariably a heavy buyer of foreign wheat. She imports principally from the United States, Russia, France, and Germany, the leading competitors in the supply being the first named two. For the decades ending with 1870 and 1880, the proportions of wheat imported into the United Kingdom from the United States, Russia, and Germany, are reported to have been as follows:

	1870.	1880.
United States, per cent.....	27.1	47.8
Russia.....	26.6	20.4
Germany.....	20.5	7.5
Other sources.....	25.5	44.8
Totals.....	100.0	100.0

The authority from which we quote the above percentages gives only three countries. It is fair to assume that most of the wheat received into the United Kingdom in the two decades from other sources came from France. In 1861 to 1864, both years inclusive, the United States contributed from 34 to 39 per cent. of the foreign wheat received into the United Kingdom. In 1865 the quantity suddenly dropped to 5.5 per cent., and in 1868 it was less than 3 per cent. It then steadily rose from 12 per cent in 1867 to 40 per cent. in 1870. In 1871 it fell to 34, and in 1872 to 21 per cent. But the quantity for 1873 was over double that of 1872, and for the last eight years it has been from 40 to 65.4 per cent., actually reaching 55.4 per cent. in 1880, while Russia contributed only 5.25 per cent. in 1880, and never more than 42 per cent., and that was in 1872.

As will be seen, the United States has grave responsibilities in the matter of the supply of bread, as well as fine opportunities for wealth in the cultivation of wheat. We have not only our own 50,000,000 people to feed, but we are exclusively feeding with bread from 30,000,000 to 40,000,000 of other nations. The fact that we can raise wheat cheaper than other countries has a twofold influence. It opens foreign markets to us, and it attracts tillers of foreign soil to our shores. The maximum product of wheat in the United States has not been reached by a long way. It is within the possibilities of the future to double the yield. California and Oregon suffer the disadvantage of being the most remote States from the chief source of demand, but the agencies are at work to overcome this

obstacle. Probably the true solution of this inconvenience will be solved when we ship more flour and less wheat to Europe. This involves a saving of about one-third in the cost of transporting the crop, and at the same time it would develop a milling interest here of great importance.—*New York Shipping List*.

LEGAL MATTERS.

DOWNTON VS. ALLIS.

In the above entitled action a decree of the U. S. District Court for the Eastern District of Wisconsin, was entered in favor of the plaintiff. The following shows the proceedings in Court:

UNITED STATES OF AMERICA, } ss.
EASTERN DISTRICT OF WISCONSIN. }

At a stated term of the Circuit Court of the United States of America, for the Eastern District of Wisconsin, begun and held according to law, at the city of Milwaukee, in said District, on the first Monday (being the third day) of October, A. D. 1881, present and presiding the Honorable Charles E. Dyer, District Judge.

On the sixth day of the said term, to-wit: on the eighth day of October, A. D. 1881, the following proceedings were held to-wit:

Robert L. Downton, }
vs. } In Equity—Original Bill.
Edward P. Allis. }
Edward P. Allis, }
vs. } Cross Bill.
Robert L. Downton. }

This day came the parties by their counsel, and these causes having been heretofore heard upon the pleadings and proofs, on consideration thereof and the arguments of counsel thereon, it is ordered, adjudged and decreed by the court, that Edward P. Allis, during the year 1876, was doing business under the firm name of Edward P. Allis & Co., and that the paper writing executed by Robert L. Downton, dated the third day of January, 1876, in the words and figures following, to-wit:

"For and in consideration of the sum of one hundred and twenty-five dollars to me in hand paid by Edward P. Allis & Co., of Milwaukee, Wisconsin, I hereby sell, assign and set over to said Allis & Co., their successors and assigns, the exclusive right to manufacture and sell rolls for crushing grain or middlings or other substances, which right or process is secured to me under United States Patent, number 162,157, dated April 20th, 1875, for the full life of such patent and any reissues, extensions and improvements thereon, except that a shop right to manufacture and sell the same in the State of Minnesota, but not elsewhere is granted to O. A. Pray, of Minneapolis, said Allis & Co. having an equal right to sell in said State of Minnesota. Dated at Milwaukee, Wis., this third day of January, A. D. 1876," and duly recorded in the Patent Office of the United States on the 27th day of January, 1876, does not assign to Edward P. Allis any title whatever in and to Letters Patent No. 162,157, dated April 20, 1875, granted to said Downton, but that the right and title thereto still remain in said Downton, and so far as it is claimed by said Allis, that said paper writing assigned to him any title in and to said patent, the same is void and of no effect.

And it is further ordered, adjudged and decreed by the court, that the said Edward P. Allis, his agents and employees, be and hereby are enjoined and restrained from claiming in any manner any title to said patent, or from authorizing or licensing any person whatever to use the process covered by said patent by virtue of said paper writing.

And it is further ordered adjudged and decreed by the court that the cross bill of Edward P. Allis filed herein, be and the same is hereby dismissed at the costs of said Allis, and that the said Robert L. Downton have his costs herein both in the original and cross bill, to be recovered of said Edward P. Allis, for which execution as at law shall issue.

CHAR. E. DYER, Judge.

UNITED STATES OF AMERICA, } ss.
EASTERN DISTRICT OF WISCONSIN. }

I, Edward Kurtz, Clerk of the Circuit Court of the United States of America, for the Eastern District of Wisconsin, do hereby certify that I have compared the foregoing with its original now on file and of record in my office, and that the same is a true and correct copy of the final decree in the suit of Robert L. Downton vs. Edward P. Allis, (original bill) and Edward P. Allis vs. Robert L. Downton (cross bill).

In testimony whereof, I have hereunto set my hand, and duly affixed the seal of the said court at the City of Milwaukee, in said District, this 18th day of October in the year of our Lord, one thousand eight hundred and eighty one, and of the Independence of the United States, the 106th.

[SEAL.] EDWARD KURTZ, Clerk.

CHILLED IRON ROLLER MILLS.—A Vienna paper states that eight hundred of Ganz's roller mills are at present at work in the Budapest mills, distributed among them as follows: First Ofen Pesth Mill; 160, Pannonia; 120; Concordia, 80. Millers' and Bakers, 60; Union, 60; Elisabeth, 70; Gisella, 60; Louise, 40; Pesth Roller Mills, 20; and Hagenmacher's 60.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, NO. 118 GRAND AVENUE, MILWAUKEE, WIS.

SUBSCRIPTION PRICE.—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid.....\$1 00
To Canadian subscribers, postage prepaid.....1 00
Foreign Subscriptions.....1 50
All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
Bills for advertising will be sent monthly, unless otherwise agreed upon.
For estimates for advertising, address the UNITED STATES MILLER.

[Entered at the Post Office at Milwaukee, Wis., as second class matter.]

MILWAUKEE, NOVEMBER, 1881.

MARKET REVIEW.

Prepared expressly for the "United States Miller," by Messrs. E. P. Bacon & Co., of Milwaukee, Wis.

Wheat has ruled comparatively steady for the past few weeks, with a general feeling, however, that prices must recede further, to correspond with those ruling at seaboard and foreign markets. The demand to cover short sales, together with continued rainy weather, which has retarded the threshing and marketing of grain in the country, as well as having damaged the grain in the stock seriously, has held the downward tendency in check. The latter influence, however, seems to have spent its force, and during the past two days short sellers have taken fresh courage, and, aided by large "hedging" sales by millers here and elsewhere, have effected a decline of three to four cents per bushel. The mills throughout the Northwest have been running at nearly their full capacity for the past two months, and have overstocked the markets both in this country and Great Britain with flour and are now forced to stand still for a while, until the consumption measurably overtakes the production. This will probably have the effect to bring considerable wheat upon the market here from localities where the supply has hitherto been absorbed by mills, which will tend to produce further depression and equalize values in home and foreign markets. The export movement during the past month has been only half what it was the preceding month, and notwithstanding light receipts at all points, stocks in store are accumulating and the "visible supply" in this country shows an increase of 1,205,700 bushels during the month. The quantity afloat for Great Britain and the continent shows an increase of 3,890,000 bushels during the same period. Prices are nevertheless controlled more by speculative than natural influences, which often operate in opposite directions. It is thought that this market is largely over-sold for December and January delivery, and with the vicissitudes of the weather at this season of the year, any bold operator of sufficient resources might give the market a severe "twist." It may be an open question, also, whether prices have not receded far enough, their intrinsic merits alone considered. The latest estimates of the Agricultural Department at Washington, just made up, place the aggregate yield of wheat for the entire country at 117,000,000 bushels less than last year. We exported from the previous crop in wheat, and flour equivalent to wheat, about 180,000,000 bushels. The increased requirements of this country for the present crop year, for bread and seed, with the large immigration together with the natural increase in population, will probably be not less than 13,000,000 bushels. This would leave us only 45,000,000 bushels for export, plus whatever excess of old wheat has been carried over this year as compared with last. This is a very uncertain quantity and variously estimated at from 25,000,000 to 50,000,000 bushels. We have already exported nearly 40,000,000 bushels from the Atlantic coast since the 1st of July, the date on which the winter wheat crop commences to move, in addition to those from the Pacific coast. How much more have we to spare, with the large deficiency existing in other articles of food? The potato crop alone shows a deficiency of 20 per cent. as compared with last year, according to the Agricultural Department estimates, or 64,000,000 bushels.

The market this morning opened depressed, with sales at \$1.33½ for December, which is the principal delivery now dealt in, rallied

later to \$1.34½, but weakened again and closes unsettled at 1:00 P. M. at \$1.33. Transactions in cash wheat or for November delivery are very light at 2c under December.

E. P. BACON & Co.,
Commission Merchants.

Oct. 31, 1881.

DURING the eleven months ending with September, \$111,219,723 worth of provisions (breadstuffs excluded), tallow and dairy products were exported.

DURING the eight months ending August 1881, there were exported from this country 317,039,651 gallons of petroleum and petroleum products valued at \$30,187,250.

THE membership fee of the Milwaukee Chamber of Commerce has been increased from \$350 to \$1000. Thirty-two new members were admitted just before the raise.

FIFTY eight thousand, four hundred and fifty-four immigrants arrived in the United States during the month of September, against 53,874 for the same month in 1880.

DURING the month of September our exports of breadstuffs were of the value of \$19,947,144; for the nine months ending Sept. 30, \$177,452,349 against \$209,204,277 for corresponding period last year.

In a letter recently received from Messrs. Charles B. Slater & Co., of Blanchester, O., they state that they are crowded with business. Slater's bolting reels are in great demand.

RELIABLE statistics show that the wheat acreage in this country is spreading in advance of the rate of increase of population. It follows therefore that year by year we will have more wheat available for export.

OUR readers who are intending to put in rolls, will find it to their advantage to write to C. N. Miller, at Mansfield, O. He is agent for the Stevens rolls, and also for several brands of bolting cloths. Read his two new advertisements in this issue.

WE desire every flour mill owner receiving a copy of this paper, to answer the questions asked in our advertisement in regard to Flour Mill Directory, which they will find in this issue. It is certainly worth the trouble to you to answer our request fully and promptly.

THE annual consumption of eggs in the United States is stated at 100,600,000 barrels, while the poultry consumed amounts to 680,000,000 pounds worth \$380,000,000 annually.—*Western Manufacturer*.

THE population of the United States is about 50,000,000. The above estimate gives two barrels of eggs to every man, woman and child in the country! The *Western Manufacturer* is either "a little off" or else we are "h—ll on eggs."

COL. JOHN W. COLLINS, of Chicago, spent a few days in Milwaukee lately, and "took in" our great Exposition. He expressed himself highly pleased with the display at the Exposition, and also with the magnificent Exchange Room of our Chamber of Commerce. The Garden City Mill Furnishing Co., of which Col. Collins is President, had their purifier and wheat brush machine in operation in the milling department of the Milwaukee Exposition.

A Word to Advertisers.

The advertising columns of the UNITED STATES MILLER are of great value to all desiring to reach the milling and grain trade. It is sent to all millers in the United States and Canada at intervals (whether subscribers or not), whose names and addresses we have been able to obtain. It is on file in the offices of the United States Consuls in all parts of the world, and also in the principal Chambers of Commerce in America and Europe. Our foreign subscription list is constantly increasing, as is also, we are glad to note, our foreign advertising patronage. We have received many letters of high approval of the UNITED STATES MILLER from subscribers and advertisers. Parties desiring further particulars in regard to amount of circulation, rates, etc., will be

promptly supplied with information by addressing us.

WE acknowledge the receipt of a copy of James Henderson's Business Directory of Manitoba, published at Winnipeg; price, \$4.00. We commend this publication to all classes of business men who desire to extend their trade across our northern boundary. Manitoba is one of the finest wheat countries in the world, and its resources are rapidly developing, and it will undoubtedly pay to make reasonable efforts to extend trade in that direction.

The Atlanta Exposition.

This first industrial exhibition of great proportions in the South opened October 5th, and was in every way more extensive and successful than its most sanguine friends had dared to expect. It is a great thing for the South. It draws to the South the attention of the whole country and will be the means of securing the investment of millions of Northern and European capital permanently in Southern enterprises. Every inch of available space is occupied, and the exhibition in some respects is of more interest than any previous one. Cotton and sugar machinery of course form the most interesting features of the exhibit.

The United States Miller.

The office of this paper has been removed from the Grand Opera House, to No. 118 Grand Avenue, directly opposite the Plankinton House, where we shall be pleased, in the future to meet our friends. This paper has now entered upon its twelfth volume and is recognized far and near as an able and reliable journal, published in the interests of the milling industry. We take this occasion to thank our advertising patrons and subscribers for their favors, and pledge ourselves to use the best of our ability to serve their interests. We cordially invite those connected with the trade to call on us when visiting Milwaukee, one of the great milling centers of the world.

Our Visitors.

During the month of October we were favored with calls from the following named gentlemen interested in the milling industry: Mr. Mann, representing the George T. Smith Middlings Purifier Co., of Jackson, Mich.

Mr. Case, of the Case Manufacturing Co., of Columbus, Ohio.

Mr. Vandercook, representing the Electric Middlings Purifier Co., of New York City, Clifford F. Hall, Esq., editor of the *Grain Cleaner*, of Moline, Ill.

Col. John W. Collins, of the Garden City Mill Furnishing Co., of Chicago.

W. McLean, representing the Richmond Manufacturing Co., of Lockport, N. Y.

T. Reidl, M. E., of Budapest, Hungary, an eminent millwright.

Mr. Thornburg, of the firm of Thornburg & Glessner, manufacturers, Chicago, Ill.

James D. Warner, Esq., custom house broker and forwarder, New York City, N. Y.

Judge Jameson on "Corners."

Judge Jameson recently delivered an emphatic address to the grand jury in Chicago, calling their attention to that part of the Illinois statutes which makes it an offense punishable by fine and imprisonment to "contract to have or give the option to sell or buy at a future time any grain or other commodity, stock of any railroad or other corporation, or gold, or forestall the market by spreading false rumors to influence the price of the commodities therein, or corner the market, or try to do so, in relation to any of such commodities."

Judge Jameson said, in commenting on this law, that the fact that property sold to be delivered at a future day does not make the contract illegal although it is not at the time possessed or owned by the seller, or that the time of its delivery is left within fixed limits, optional with buyer or seller, though, in one sense, any such sale

is the sale of an option, apparently within the statute. What makes it a gambling contract is the intent of the parties that there shall not be a delivery of the commodity sold, but a payment of the differences by the party losing upon the rise or fall of the market. He concluded his remarks by saying: "The course of business instead of proceeding quietly and healthily, will become broken by fits of fever and panic; unlawful gains will be preferred to the slow profits of legitimate trade; our farmers, partaking of the prevalent spirit, will hold back their crops in expectation of corner processes, borrowing money on mortgage to carry on their operations, instead of realizing by the sale of farm products."

Chicago grain gamblers do not like the present aspect of affairs and are keeping pretty quiet while the grand jury is sitting.

C. C. N. writes us wishing to know where may be found a 48 inch single leather belt running 6200 feet per minute—such as referred to (on page 132) in Abernethy's "Practical Hints on Mill-building," as giving off 342 32 horse-power with 180° arc of contact.

Mr. Abernethy claims to be eminently a practical man and of course he draws his conclusions from his own experience in mill-building and belt running. A letter addressed to him in care of *The Grain Cleaner*, Moline, Ill. may bring a detailed reply or perhaps Mr. Abernethy will choose to answer the query in our columns.

AVOIDANCE of vibrations with machinery was instanced with a Carr disintegrator, which, being mounted in a pit lined with bituminous concrete, was worked at 500 revolutions per minute without sensible tremor, whereas with the former wooden mountings on an ordinary concrete base, the vibration was excessive, and extended over a radius of twenty-five yards. In the Paris Exhibition of 1878 there was shown a block of bituminous concrete weighing forty-five tons, forming the foundation of a Carr disintegrator used as a flouring mill, 1,400 revolutions a minute, a speed which would have been impracticable on an ordinary foundation.

Items of Interest.

The Arctic Mill in Minneapolis is being changed to the complete roller system.

Asmuth & Kraus, of Milwaukee, have imported a cargo of Canadian barley on which they paid the government duty to the amount of \$3200. The lot, one of 2,100 bushels, will be consumed by local brewers.

The capacity of the steel works of the world is estimated at about 3,000,000 tons a year. The Bessemer works in England contribute about 800,000 tons; the United States 750,000 tons more; Germany about 500,000; France about 275,000; Belgium, 150,000; Austria, 250,000 and Russia and Sweden about 150,000 tons.

In 1390, some friars in Switzerland wished to build a wind mill to save the labor of grinding corn by hand; but a neighboring landlord, who had bought the country around, forbade them, because, he said, he owned the winds. The bishop was appealed to, who said that the winds belonged to the church and could not be used.

The Glasgow Herald notes that a company for lending corn sacks to merchants and agriculturists has just been established in Bucharest, under the auspices of the Roumanian Railway Company. Roumanian wheat is often of good quality, but, owing to the slovenly way in which it has been harvested and packed for sale, has not been able to command full prices.

The Minneapolis Tribune says that the shipments of flour from that city for the week ending October 15, were the largest on record in the history of the city as a flour-producing point, and aggregated 76,593 barrels for the seven days. It took 853 cars or more than forty-two trains of twenty car-loads each to transport this immense amount of flour to the eastern market. Something of the extent of the manufacture of the product here may be appreciated from these figures.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

The Fire Hazard of Flour Mills.

A PRIZE ESSAY BY ERNEST C. JOHNSON.

Read before the Northwestern Underwriters' Association, Chicago, Sept. 14.

SECOND.

"The Most Thorough Statement of the Fire Hazard of the Several Methods, in Detail."

It is highly probable that more is already known concerning the inherent hazards of flour mills, than is to be, or will be, discovered in future; therefore, new ideas and theories regarding this subject are not so important, as that what is said, be based on such good authority and so tersely stated, as to be reasonably accepted by, have an influence with, and therefore be of practical benefit to millers and mill underwriters.

A treatise on mill hazards in a general way, aided by universal experience, and by the results of others' able and exhaustive research, is easy; but to state, in detail, the hazards of specific devices minutely, or even approximate the per cent. which each contributes to the whole, calls for a more elaborate knowledge and exhaustive research, than has yet centered in any one man. This requirement of the proposition is commendable for the aims to compute the fire rate by a fixed principle, but it will be a matter which more extended research, inquiry and comparison must settle, if ever conclusively determined, in a manner satisfactory to the majority concerned. However much easier it might be to generalize on this point, the proposition requires us to specify "in detail."

This entirely new treatment of the subject, together with the multiplicity of variations and combinations, and the limited time afforded an active field man for research, causes at least one, who thought he knew, to hesitate before going on record.

The causality of all fires is either the incendiary physical, the incendiary accidental, the incendiary inimical, or the incendiary speculative.

This proposition properly contemplates the consideration of the agencies physical and accidental only. Really, this not only includes the predominating causes of flour mill fires, but also is the only source capable of practical demonstration; and yet, the accidental and inimical, if not the speculative, must be taken into the rate account.

Treating these devices in detail, it will be more concise to consider the physical and accidental in conjunction, rather than specifically.

In most new, and especially remodeled mills, there is an objectionable tendency to build high. The space required for the additional machinery of gradual milling is too often obtained by adding one or more stories in height, instead of covering more ground. The necessary volume of machinery in the remodeled mill does not so often require additional space as the effort to increase the old mill's capacity or output, which is almost invariably sought for at the same time.

Increasing the capacity of old mills, when remodeling, by additional height, is so common and objectionable as to merit notice. Few mills are built strong enough to withstand the weight and strain of added stories, together with the increased load of machinery incident to modern milling. Competent judges say that the quantity and weight of machinery necessary to maintain the old mill's output, when changed to high milling, is fully doubled. Such mills have greatly increased their fire contingency, and should enlist the closest attention of the owner against accident, and the insurers of such should see that proper discriminations are made in fixing the rate.

The *Iron Age* gives the following in regard to high mills generally:

"It is a fact that, in mills of ordinary construction, a safe form for stability, and for low rate of fire destructibility, is two stories high, extending over sufficient space to give the room required. It is safe to assume that equal cubic content, with double the base area, has but one-half the fire loss liability of the double altitude, with conditions otherwise equal. Add to the fire results of difference in height the effect of the greater vibration of the higher structure, and the hazard of the higher structure is yet further augmented."

The chief aim in building high is to avoid re-elevating and spouting, by being able to feed down, from floor to floor; but the hazard of altitude more than offsets the simplicity secured, and should be so discriminated against by insurers, as to render low building an economy. It is extremely doubtful whether any economy is secured by building high, when the extra time and labor of supervision are duly computed. High mills are more exposed to accidental causes, such as lightning, sparks from remote fires, and, if frame, are liable to be racked by storms, so that the load of machinery and grain, for they all have more or less stock in mill, produces dangerous friction from trembling. The proper

supervision of machinery is more apt to be neglected, when it requires so much climbing up and down. Increased length of elevators produces heavy draft on pulleys, and their sensitive tendency to frictional fires, at the pulley-head, is greatly increased. Once on fire, they are almost sure to baffle the best facilities, and be referred to the adjuster.

The foundations of a flour mill should be such as will permanently resist the weight and workings of the machinery, and a weight of stock that might fill it to its utmost capacity. Central piers, though not exposed to frost, with independent and less substantial foundations, will not answer. They, and the chimneys, if any, must rest on solid masonry.

A separate building for grain and flour storage is unquestionably best and cheapest, because it lessens the value exposed to the mill fire rate; but the reduction it would secure in the mill rate, would depend on the relative strength of the mill building for its work, as the chief result would be the removal of weight. Such a storage building should be as nearly fire-proof as possible, should be strictly for storage and shipping, should have as little machinery in it as will handle its contents, and should have the power transferred to it from the mill, in order to reduce the fire rate to the lowest minimum possible.

Cleaning machinery should never be placed in such warehouses. It is less convenient for proper supervision; it adds greatly to the fire rate of the values you have sought to remove from danger; and the mill is a more proper place for it. By this arrangement, the mill, containing all of the hazardous operations, is reduced to a machine, through, and out of which, values pass from its fire reach, instead of accumulating and being subjected to its hazards and augmenting its combustibility. A part of the mill building, cut off by thorough fire wall, is the next best method of storing grain and flour; but there is no place where you can afford to be so extravagant, as in making that wall so heavy and so independent as to be accepted by insurers, as a real cut-off of mill hazards.

Wooden roofs are especially bad for flour mills, where so much dust of various kinds is liable to increase the sensitiveness to sparks from any source. Eave-spouting should be so arranged that the igniting of the dust, which often fills them, will not set fire to wooden cornice, roof-boards, or be drawn into the mill between the rafters.

A larger number of steam mills burn from faulty boiler houses and defective stacks than should. It is quite as important that the boiler house roof be fire-proof inside as outside. It is comparatively inexpensive to cut off the boiler room by a brick wall with iron-clad doors, and render it nearly fire-proof. As a matter of economy, the fine working parts of the engine should be not less thoroughly protected from the rapid injury of furnace room dust, and also dust from the mill. Place the engine room between the mill and furnace room, with a brick wall and heavy iron-clad doors on the mill side, as well as on the boiler room side.

Iron stacks soon become defective, if they are not so in some respects, when erected, and should pay more than the usual half of one per cent. extra, because, in permanent improvements they almost invariably indicate less safe and thorough construction generally.

Water as a motor has only four noticeably objectionable features. 1. Too much of it overflowing the fore-bay, starting the mill untended, and burning it from frictional fire. 2. Too little of it to sustain a profitable running season. 3. Litigation as to the use of and abuse of the privilege, as affecting others' rights and interests. 4. A recently suggested probability of its producing, in this connection hydrogen gas, or fire damp, rendering the mill atmosphere more explosive, and explosions more destructive. A good mill site does not, necessarily, make a good site for a mill; and a profitable site is not always found by a dam site.

Wind engines have only been the direct cause of loss from unexpected force and speed, causing fire from friction.

In steam mills heating by other means than steam is inexcusable, because it is inexpensive; with pipes, properly secured, it lessens the hazard, and it can be easily arranged so that, from the boiler room, in case of fire, it may be utilized through the same pipes, as an effective fire smotherer. In water mills, where the heat may be necessary to warm the grain for grinding, and for heating, place the boiler stove in office, where it will do double service during most of the season. Heating by stoves if indispensable, must have all the safeguards usual and useful.

Lights in a mill, properly arranged for even distribution of daylight, for general purposes, can be stationary globe lamps, of approved style, taking their ventilation from outside the mill,

and discharging the heated air through a series of alternating perforated plates, at least eight inches above the flame. The danger of a lamp is not so great at its top, as there is an upward current; but the draft must be thoroughly protected with a series of perforated plates or Davy gauze. Movable lights must be inclosed in protected globes, and be ventilated by a series of perforated plates, or Davy gauze, at bottom and top, and supplied with lard oil only.

Among the incendiaries physical, the chief source of ignition in flour mills is from frictional heat. Incipient fires are more often discovered and extinguished in flour mills than is generally known by underwriters. This research has brought out many instances of miniature explosions, friction fires, and peculiar starters, which were not only extinguished without special damage, but which, for the good of the milling cause, not less than for the serenity of insurers, were hidden under a bushel. We enjoin millers not to let their lights shine, which, figuratively, is superfluous, and, practically, is now seconded by a motive of self-preservation.

Millers are exceedingly non-committal in such matters, as well as to all causes and effects incident to their pursuit. This peculiarity of millers has developed two erroneous conclusions among insurers; first, that the origin of mill fires is mysteriously unascertainable; and second, that nearly all ignitions prove fatal.

It is the opinion of the experienced authority quoted above, that there is no line of manufacturing, in which so many ignitions occur from various sources, as in flour mills. That the number of ignitions which prove fatal, or are disastrous enough to give publicity, compared with the number which actually occur in all classes of mills, and are suppressed without damage, does not exceed ten per cent.

The degree of danger from frictional heat depends: 1. On the specific gravity of the speed rate. 2. On the weight of the running parts, and of the material carried by them. 3. On the evenness or variation of this draft on the working parts. 4. On the adaptation and adjustment of the boxes for the speed rate intended. 5. On the ventilation of the bearings, or confinement in contact with heated or heat-producing material. 6. On the character and frequency of supervision while running. 7. On the character and quality of lubricants used. 8. On conditions which can neither be guarded against nor detected afterward; a source which cannot be accounted for by the machine, or its connections and surroundings. 9. On the condition in which the bearings are left when the mill closes for the day.

Two mills burned from like cause in Europe last year. The one had not been running two years; the other, mostly frame, had been in operation over two hundred years.

The degree of care in the supervision of machinery is a vital element in the longevity of flour mills. Regardless of speed rate, there are few devices in the flour mill that do not, in some degree, add to the fire contingency. Even hand tools may be displaced, and become the fire producing means of some attending cause.

The engine should be carefully regulated by a fly-wheel, of such weight as will store up power enough to carry it past the dead points with perfect smoothness. No line of manufacture requires as even transmission of power as the mill-stone system. A light balance wheel has often been the chief cause of one mill doing much less satisfactory work than another. The jerking motion of an improperly balanced motor is damaging to machinery, and produce unnatural and dangerous friction.

The main shaft from the motor, usually in basement, makes from 70 to 160 revolutions per minute. In large mills these vary from 5 to 8 inches in diameter, and by length of mill. There is an immense strain on the shaft, and its bearings need watching. Power, from the main shaft to line shafting, and machinery on upper floors in modern mills, is now being generally transferred by belt. Upright power shafts were had in old mills, but with the increased shafting required in gradual milling, such are exceedingly objectionable, because of liability to get out of trim, bind, and generate frictional heat. Especially so when connections are by bevel gear.

The shafting of modern mills is not only largely increased, but the speed is higher, and requires more careful supervision. A shaft in perfect alignment, at rest, may be deflected by the various strains on it at work, by vibrations caused by weight on the floors, and result in dangerous frictional heat.

Journals will run for months without heating, and again, with the same care, perfect lubrication, and every discernable feature in perfect order, will rapidly heat, and no mechanic can tell the cause. These, cooled and started, may run again for months without re-occurring. This feature of friction heating has not yet found explanation. A journal that heats regu-

larly has some attending cause discernible; sometimes lengthening of the bearing will prevent it, but heating of bearings cannot be certainly prevented, and none of them, no matter how long they have run coolly, can be safely overlooked in supervision. This important feature of mill hazard comes from the experienced mechanics and millers quoted above.

The boxes must be carefully protected by caps, to keep the oil from being absorbed and hardened by dust, and to keep dust from the bearings; and the formation of congealed oil and dust must be removed from the boxes and shafting, otherwise the grit will work into the bearings, and naturally produce dangerous friction. There must be drip cups under bearings of all machines.

Only a high grade of lard oil, sperm oil, and tallow, should be used for lubricating. It is not safe to depend on getting a reliable mineral oil. There is so much compounding of the same, that it is difficult to distinguish good from bad. Recently fire commenced flying in every direction from a power pulley on line shaft; the machinery was stopped, and, on examination, the bearing was not heated. The display was caused by flashing of poor quality of black oil. In flour mills a great mistake is made in employing men of inferior ability to oil machinery. The oiler should be a man of system, and understand all indications of improperly working gear, and of deficient oil. He should be a judge of oil from its actions in use.

Good authority on lubricating gives the following: "A great difficulty with all tyros, in the use of machinery, is the wasting of oil by its too profuse use. It often happens that a bearing will heat when supplied with too much oil that will run cool when supplied with the proper quantity. The reason is, that when the lubricator is partly worn, it becomes sticky; it resists removal; it remains tenaciously between the shaft and its bearings; whereas, too much of it, usually thin and limpid, serves to 'wash the bearing,' and let the parts into closer contact. For steel surfaces, lubricated with best sperm oil, moving slowly, 1,000 pounds pressure per square inch of bearing surface has been found permissible; for iron journals, 800 pounds per square inch should not be exceeded. The oil, which allows the greatest heat to accumulate with the fewest revolutions, must be a bad lubricant."

Bevel gears are bad in a number of ways; they do not give as smooth action, and are liable to get out of mesh, and the least binding will not only produce dangerous frictional heat, but the slowest mill motion, in this condition, is sufficient to throw off friction sparks. Bevel gear on an upright shaft of not over 40 turns per minute, in an old mill at Westville, Ind., struck off sparks which ignited the dust on a beam in top of mill, and, when discovered, it had burned a space the size of a hat, although the frictional heat had not dangerously increased.

Belt gearing has been so perfected as to give a more steady and uniform transmission of power. Driving by reel belt is very much preferable to that of bevel gear. It gives a more steady and substantial action, and better facilities for starting and stopping any or all machinery.

Belt rests and tighteners are bad in a number of ways. Undue pressure of the belt causes the pulley to stop, and the rubbing of the belt against it rapidly produces frictional heat, which, however, usually burns off the belt before any other damage is done.

Metal boxes and iron pulleys are more reliable, and safer, for all places and speeds. Wooden boxes should never be used in flouring mills, for speeds over 80.

Cotton belting should never be used in flour mills, because of its liability to stretch and shrink, and to fray out at the edges, in running against the belt fork, and in various ways. It is not only more liable to clog in elevators, but when clogged, will ignite from friction of the running pulley, and act as a fire conductor. Good leather belting is the best for mill purposes, and, if used with grain side to the pulley, will give more satisfactory action and drive nearly one-third more than with the flesh side.

[TO BE CONTINUED.]

The superiority of electricity over steam convincingly demonstrated: "Yes, sir, we have entered upon an era of electricity, and steam will be done away with forever—replaced everywhere by the electrical machine." "How are they run—those electrical machines?" "I don't ever remember seeing one." "By steam power."

"What is a debt of honor?" asked "one of the boys" last night, as he leaned against a C. street bar. His venerable companion, who has drank free whisky on the Comstock ever since he got broke in the collapse which followed the Yellow Jacket lye, changed the position of his cigar, and expectorating, reflectively said: "I am not sure, but I believe a debt of honor is generally a debt which has been contracted in some dishonorable way."

MODERN SCIENTIFIC MILLING.

THE IMPROVEMENTS THAT ARE BEING INTRODUCED
IN THE NEW YORK CITY ROLLER FLOUR
MILLS—THE FINEST IN THE STATE.

For hundreds, or rather for thousands, of years, the grinding of wheat was conducted in primitive style and but few improvements were ever suggested or introduced. It was not until within the present century that even in Europe any great progress was made. But for a long time past the millers of Hungary have enjoyed a high reputation, based upon their thorough-going methods and the excellence of the results arrived at. In the United States, great attention has of late years been paid to milling from a scientific point of view, and various patent and other processes have from time to time been brought out. Yet it is found that the old Hungarian method is, after all, by long odds, the best. It was first introduced to this country by Mr. W. D. Gray, who had a long experience in the milling districts of Hungary. Messrs. Jones, proprietors of the New York City Roller Flour Mill, have availed themselves of his experience and inventions, embracing his patent noiseless roller machine in the rebuilding of their old and well-known establishment at Broome and Lewis streets. Mr. Gray is now connected with E. P. Allis & Co., of Milwaukee, and he has full charge of the entire improvements. It is no news to the milling profession to say that he is the most eminent mill builder of either this or any other country. He built many of the principal mills in the West, and his work is beyond all successful rivalry.

A Review reporter called a day or two ago at the premises at the above address and was courteously conducted through the greater part of the establishment by one of the members of the firm. The building is a grand structure, fronting 125 feet on Broome street and 125 on Lewis, and the height is six stories with basement. The walls are remarkably heavy, being three feet in thickness. A splendid 700 horsepower Corliss engine drives the entire machinery, the equipment of which is probably the finest to be found in any mill in the country. The milling capacity will be from 1,100 to 1,300 barrels of flour daily, or from 350,000 to 500,000 barrels per annum. The storage capacity is equal to 25,000 barrels of flour and about 50,000 barrels of wheat and feed.

The reporter jotted down a few particulars regarding each story of the mammoth building, which may be presented here in anticipation of the opening of the mills for business, when an elaborate account will be given.

On the first floor are the offices, fitted up in oak and cherry. Back of here is the roller floor, where are sixty-four of Gray's patent noiseless roller machines. Formerly stones were used but there are none at all in the new building as machinery. The second is the packing floor. The third, fourth, fifth and sixth floors are fitted up with a vast array of the most improved machinery yet introduced. Some 50,000 feet of belting will be needed, and the main belt will be 140 feet long and 40 inches wide. Work is now going on with great rapidity in anticipation of the opening of the mills for business, which will be about December 1st. Altogether this establishment will be acknowledged by all who see it to be the finest in the country.—*New York Mercantile Review.*

AMERICAN MILLING METHODS.

The following paper was read before the meeting of the Pennsylvania State Millers' Association, at Pittsburg, Pa., by Albert Hoppin:

To speak of the wonderful strides which the art of milling has taken during the past decade has become exceedingly trite. This progress, patent to the most casual observer, is a marked example of the power inherent in man to overcome natural obstacles. Had the climatic conditions of the Northwest allowed the raising of as good winter wheat as that raised in winter wheat sections generally, I doubt if we should hear so much to-day of new processes and gradual reduction systems. So long as the great bulk of our supply of breadstuffs came from the winter wheat fields, progress was very slow, the mills of 1860, and I may even say of 1870, being but little in advance so far as processes were concerned, of those built half a century earlier. The reason for this lack of progress may be found in the ease with which winter wheat could be made into good, white merchantable flour. That this flour was inferior to the flour turned out by winter wheat mills now is proven by the old recipe for telling good flour from that which was bad, viz: To throw a handful against the side of the barrel, if it stuck there it was good, the color being of a yellowish cast. What good winter wheat patent to-day will do this? Still the old time winter wheat

flour was the best there was, and it had no competitor. The settling up of the Northwest, which could not produce winter wheat at all, but which did produce a most superior article of hard spring wheat, was a new factor in the milling problem. The first mills built in the spring wheat states tried to make flour on the old system, and made a most lamentable failure of it. I can remember when the farmer in Wisconsin, who liked a good loaf of bread, thought it necessary to raise a little patch of winter wheat for his own use. He oftener failed than succeeded, and most frequently gave it up as a bad job. Spring wheat was hard, with a very tender, brittle bran. If ground fine enough to make a good yield, a good share of the bran went into the flour, making it dark and specky. If not so finely ground the flour was whiter, but the large percentage of middlings made the yield per bushel ruinously small. These middlings contained the choicest part of the flour-producing part of the berry, but owing to the dirt, germ and other impurities mixed with them, it was impossible to regrind them except for a low grade flour. Merchant milling of spring wheat was impossible wherever the flour came in competition with winter wheat flours. At Minneapolis, where the millers had an almost unlimited water power, and wheat at the lowest price, merchant milling was almost given up as impracticable. It was certainly unprofitable. To the apparently insurmountable obstacles in the way of milling spring wheat successfully, we may ascribe the progress of modern milling. Had it been as easy to raise good winter wheat in Wisconsin and Minnesota as in Pennsylvania and Ohio, or as easy to make white flour from spring as from winter wheat, we should not have heard of purifiers and roller mills for years to come.

The first step in advance was the introduction of a machine to purify middlings. It was found that the flour made from these purified middlings was whiter than the flour from the first grinding, and brought a better price than even winter wheat flours. Then the aim was to make as many middlings as possible. To do this and still clean the bran so as to make a reasonable yield, the dress of the burrs was more carefully attended to, the old-fashioned cracks were left out, the faces and furrows made smooth, true, and uniform, self-adjusting drivers introduced, and the driving gear better fitted. Spring wheat patents rapidly rose to the first place in the market, and winter wheat millers waked up to find their vantage ground occupied by their hitherto contemned rivals. To their credit it may be said that they have not been slow in taking up the gauntlet, and through the competition of the millers of the two climatically divided sections of this country with each other and among themselves, the onward march of milling progress has been constantly accelerated. Where it will end, no man can tell, and the chief anxiety of every progressive miller, whether he lives in Pennsylvania or Minnesota, is not to be left behind in the race.

The millers of the more eastern winter wheat states have a two-fold question to solve. First, how to make a flour as good as can be found in the market, and second, how to meet western competition, which, through cheap raw material and discriminating freight rates, is making serious inroads upon the local markets. Whether the latter trouble can be remedied by legislation, either state or national, or not, remains to be proven by actual trial. That you can solve the first part of the problem satisfactorily to yourselves depends upon your readiness to adopt new ideas and the means you have at hand to carry them out. It is manifestly impossible to make as good a flour out of soft, starchy wheat as out of that which is harder and more glutinous. It is equally impossible for the small mill, poorly provided with machinery, to cope successfully with the large merchant mill fully equipped with every appliance that American ingenuity can suggest and money can buy. I believe, however, that a mill of moderate size can make flour equally as good as the large mill, though, perhaps, not as economically in regard to yield and cost of manufacture.

The different modes of milling at present in use may be generally divided into three distinct processes, which, for want of any better names, I will distinguish as old style, new process and gradual reduction. Perhaps the German division of low milling, half high milling and high milling is better. Old style milling was that in general use in this country up to 1870, and which is still followed in the great majority of small custom or grist mills. It is very simple, consisting in grinding the wheat as fine as possible at the first grinding and separating the meal into flour, superfine or extra, middlings, shorts and bran. Given a pair of mill stones and a reel long enough, and the wheat could be made into flour by passing through the two. Because spring wheat was so poorly adapted to

this crude process, it had to be improved and elaborated, resulting in the new process. At first this merely consisted of purifying and regrinding the middlings made in the old way. In its perfected state it may be said to be half way between the old style and gradual reduction, and is in use now in many mills. In it millstones are used to make the reductions, which are only two in number, in the first of which the aim of the miller is to make as many middlings as he can while cleaning the bran reasonably well, and in the second to make the purified middlings into flour. In the most advanced mills which use the new process, the bran is reground and the tailings from the coarse middlings containing germ and large middlings with pieces of bran attached are crushed between two rolls. These can hardly be counted as reductions, as they are simply the finishing touches, put on to aid in working the stuff up clean, and to permit of a little higher grinding at first. Regarding both old style and new process milling, you are already posted. Gradual reduction is newer, much more extensive, and merits a much more thorough explanation. Before entering upon this I will call your attention to one or two points which every miller should understand.

The two essential qualities of a good marketable flour are color and strength. It should be sharply granular and not feel flat and soft to the touch. A wheat which has an abundance of starch, but is poor in gluten, cannot make a strong flour. This is the trouble with all soft wheats, both winter and spring. A wheat which is rich in gluten is hard, and in the case of our hard Minnesota wheat has a very tender bran. It is comparatively easy to make a strong flour, but it requires very careful milling to make a flour of good color from it. Probably the wheat which combines the most desirable qualities for flour making purposes is the Red Mediterranean, which has plenty of gluten and a tough bran, though claimed by some to have too much coloring matter while the body of the berry is white. By poor milling a good wheat can be made into flour deficient both in strength and color, and by careful milling a wheat naturally deficient in strength may be made into flour, having all the strength there was in the wheat originally and of good color. Good milling is indispensable, no matter what the quality of the wheat may be.

The idea of gradual reduction milling was borrowed by our millers from the Hungarian mills. There is, however, this difference between the Hungarian system and gradual reduction, as applied in this country, that in the former when fully carried out, the products of the different breaks are kept separate to the end, and a large number of different grades of flour made while in the system, as applied in this country, the separators are combined at different stages and usually only three different grades of flour made, viz: patent, bakers', or as it is termed in Minnesota, clear flour, and low grade or red dog. In the largest mills the patent is often subdivided into first and second, and they make different grades of bakers' flour, these mills approaching much nearer to the Hungarian system; though modifying it to American methods and machinery. In mills of from three to five hundred barrels daily capacity, it is hardly possible or profitable to go to this subdivision of grades, owing to the excessive amount of machinery necessary to handling the stuff in its different stages of completion. The Hungarian system has, therefore, been greatly modified by American millers and milling engineers to adapt it to the requirements of mills of average capacity. This modified Hungarian system we call gradual reduction. It can be profitably employed in any mill large enough to run at all on merchant work. So far, it has not been found practical to use it in mills of less than one hundred and twenty-five to one hundred and fifty barrels' capacity in twenty-four hours, and it is better to have the mill of at least double this capacity.

Gradual reduction, as its name implies, consists in reducing the wheat to flour, shorts to bran, by several successive operations or reductions, technically called breaks, the process going on gradually, each break leaving the material a little finer than the preceding one. Usually five reductions or breaks are made, though six or seven may be used. The larger the number of breaks the more complicated the system becomes, and it is preferable to keep it as simple as possible, for even at its simplest it requires a good, wide-awake, thinking miller to handle it successfully. When it is thoroughly and systematically carried out in the mill it is without question as much in advance of the new process as that is ahead of the old style of milling.

In order that I may convey to you as clear an idea of gradual milling reduction as possible, I will give as fully as possible the programme of a mill of 150 barrels maximum daily capacity designed to work on mixed hard and soft spring wheat, and which probably will come much

nearer to meeting the conditions under which you have to mill than any other I have found readily obtainable. I have chosen a mill of this size, first, because following out the programme of a larger one would require too much time and too great a repetition of details and not give you any clearer idea of the main principles involved, and secondly, because I thought it would come nearer meeting the average requirements of the members of your association. Your worthy secretary cautioned me that I must remember that I was going to talk to winter wheat millers. The main principles and methods of gradual reduction are the same, whether applied to spring or winter wheat; the details may have to be varied to suit the varying conditions under which different mills are operated. For this programme I am indebted to James Pye, of Minneapolis, who is rapidly gaining an enviable and well deserved reputation as a milling engineer, and one who has given much study to the practical planning and working of gradual reduction mills.

And right here let me say that no miller should undertake to build a gradual reduction mill, or to change over his mill to the gradual reduction system, until he has consulted with some good milling engineer (the term millwright means very little nowadays), and obtained from him a programme which shall fit the size of the mill, the stock upon which it has to work, and the grade of flour which it is to make. This programme is to the miller what a chart is to the sailor. It shows him the course he must pursue, how the stuff must be handled, and where it must go. Without it he will be "going it blind," or at best only feeling his way in the dark. A gradual reduction mill, to be successful, must have a well-defined system, the miller must have a definite plan to work by. But to go on with my programme.

After the wheat is cleaned, it is by the first break or reduction split or cut open, in order to liberate the germ and crease impurities. As whatever of dirt is liberated by this break becomes mixed in with the flour it is desirable to keep the amount of the latter as small as possible. Indeed, in all the reductions, the object is to make as little flour and as many middlings as possible, for the reason that the latter can be purified while the former cannot, at least by any means at present in use. After the first break the cracked wheat goes to a scalping reel covered with No. 22 wire cloth. The flour, middlings, etc., go through the cloth and the cracked wheat goes over the tail of the reel to the second machine, which breaks it still finer. After this break the flour and middlings are scalped out on a reel covered with No. 22 wire cloth. The tailings go to the third machine and are still further reduced, then through a reel covered with No. 24 wire cloth. The tailings go to the fourth machine, which makes them still finer, then through a fourth scalping reel the same as the third. The tailings from this reel are mostly bran with some middlings adhering, and go to the fifth machine, which cleanses the bran. From this break the material passes to a reel covered with bolting cloth varying in fineness from No. 10 at the head to No. 00 at the tail. What goes over the tail of the reel is sent to the bran bin, and that which goes through next to the tail of the reel, goes to the shorts bin. The middlings from this reel go to a middlings purifier, which I call No. 1, or a bran middlings purifier. The flour which comes from this reel is sent to a chop reel covered at the head with say No. 9 with about No. 5 in the middle and No. 0 at the tail. You will remember that after each reduction the flour and middlings were taken out by the scalping reels. This chop, as it is now called, also goes to the same reel I have just mentioned. The coarse middlings which go over the tail of this reel go to a middlings purifier, which I will designate as No. 2. Those which go through the No. 0 cloth at the tail of the reel go to purifier No. 3; those which go through No. 5 cloth go to purifier No. 4; while all that goes through No. 9 cloth at the head of the reel is dropped to a second reel clothed with Nos. 12 to 15 cloth with two feet of No. 10 at the tail. The flour from this reel goes to the bakers' flour packer; that which drops through the No. 10 is sent to the middlings stone, while that which goes over the tail of the reel goes to purifier No. 4. We have now disposed of all the immediate products of the first five breaks, tracing them successively to the bran and shorts bins, to the bakers' flour packer and the middlings purifiers, a very small portion going to the middlings stone without going through the purifiers.

The middlings are handled as follows on the purifiers. From the No. 1 machine which takes the middlings from the 5th break, the tailings go to the shorts bin, the middlings which are sufficiently well purified go to the middlings stone, while those from near the tail of the machine which contain a little germ and bran specks, go to the second germ rolls, these being

a pair of smooth rolls which flatten out the germ and crush the middlings, loosening adhering particles from the bran specks. From the second germ rolls the material goes to a reel where it is separated into flour which goes into the bakers' grade, fine middlings which are returned to the second germ rolls at once, some still coarser which go to a pair of finely corrugated iron rolls for red dog, and what goes over the tail of the reel goes to the shorts bin. The No. 2 purifier takes the coarse middlings from the tail of the first or chop reel as already stated. The tailings from this machine go to the shorts bin, some few middlings from next the tail of the machine are returned to the head of the same machine, while the remainder are sent to the first germ rolls. The reason for returning is more to enable the miller to keep a regular feed on the purifiers than otherwise. The No. 3 purifier takes the middlings from the 0 cloth on the chop reel. From purifier No. 3 they drop to purifier No. 5. A small portion that are not sufficiently well purified are returned to the head of No. 3, while those from the head of the machine, which are well purified are sent to the middlings stones. The remainder, which contain a great deal of the germ, are taken to the first germ rolls, in passing which they are crushed lightly to flatten the germ without making any more flour than necessary. The No. 4 purifier takes the middlings from No. 2 and also from No. 5 cloth on the chop reel and from the No. 10 on the tail of the bakers' reel. The middlings from the head of this machine go to the middlings stones, and the remainder to purifier No. 6. The tailings from Nos. 3, 4, 5 and 6 go to the red dog rolls. A small portion not sufficiently well purified are returned from No. 6 to the head of No. 4, while the cleaned middlings go to the middling stones.

The portions of the material which have not been traced either to the bakers' flour or the bran and shorts bins are the middlings which have gone to the middling stones, the germ middlings which have gone to the first germ rolls and the tailings from purifiers Nos. 3, 4, 5 and 6, and some little stuff not quite poor enough for shorts from the reel following the second germ rolls. Taking these *seriatim*, the middlings, after passing through the middling stones, go to the first patent reel covered with eleven feet of No. 13 and four feet of No. 8. The flour from the head of the reel goes to the patent packer, that from the remainder of the reel is dropped to another reel, while the tailings go to the No. 4 purifier. The lower patent reel is covered with No. 14 and two feet of No. 10 cloth; from the head of the reel the flour goes to the patent packer, the remainder that passes through the No. 10 cloth which will not do to go into the patent, being returned to the middlings stones, while the tailings are sent to the No. 4 purifier.

[TO BE CONTINUED.]

How we Raise Wheat in America.

AN ITEM OF INTEREST FOR THE EUROPEAN AGRICULTURIST.

The great wheat field of California lies in Colusa county, which also contains one of the largest farms in the world. The county comprises a large part of the extensive Sacramento valley, and is sixty miles in length and on the average forty-five miles in width. It has an area of about 1,800,000 acres, of which 1,000,000 grows wheat. Of this vast tract 477,000 acres are owned by 129 men. One owns 55,000 acres; one, 24,000; one, 20,000; three, 16,000; one, 15,000; three, 14,000; six, 10,000; one, 8,000; two, 7,000; six, 6,000; three, 5,000; eight, 4,000; five, 3,000; eighteen, 2,000; three, 1,500; thirty-six, 1,000, and twenty-nine, 500. The result has been to debar immigration and choke out tradesmen and mechanics.

The largest land-owner in Colusa county is Dr. Hugh J. Glenn. His farm contains 55,000 acres, and has a river frontage of sixteen and a half miles, and is enclosed by 150 miles of fence. Wheat is grown on 45,000 acres. The labor force employed is composed of 715 men—225 in seeding and 490 in harvesting. Eight hundred horses are required. The yield of wheat from this farm will average 1,000,000 bushels a year.

Dr. Glenn was born in Virginia in 1824, and graduated at the Medical University in Missouri in 1846. Shortly afterward he married and commenced life with a capital of \$110. With that he purchased an ox team and crossed the plains to California. He engaged in mining and was successful. In 1850 he returned to Missouri with \$5,000, and bought and drove horses to California and Mexico. He made his first purchase of land in 1867, buying 70,000 acres at \$1.60 per acre, and a short time afterwards purchased 7,000 acres more at about the same price. Since then he has been absorbing the land on either side at varying prices.

Grain and Flour Trade Notes.

THE South Carolina rice fields are showing the disastrous results of the late gale, and the new crop is arriving at Charleston very slowly. The receipts to September 27 were but 901 tierces, against 1,578 tierces for the same period last year. The passage of the equinox without the recurrence of the usual storm has had a good effect, and hopes are now entertained of an escape from the usual September gale entirely. Should this be the case, the rice crop will not be as bad as we feared a fortnight ago.

THE wheat crop of 1891, in the United Kingdom is estimated by divisions, as follows, by the London Miller:

Quarters	East England	Quarters
The home counties.....1,060,000	Scotland.....2,861,250	
Southern England.....1,015,000	Ireland.....225,000	
Western England and Wales.....1,290,000	Islands.....475,000	
Northern England.....1,118,000		25,000
Middle of England.....1,680,000	Total.....9,844,250	

The Miller adds: "In 1867 the wheat crop was very deficient, but then the area was 3,640,000 acres; in 1872, another very poor year, the area under wheat was 3,840,000 acres. The crop of 1877 was estimated at 10,390,000 quarters, and 10,110,000 quarters in 1872. In 1875 the wheat crop was estimated at 19,124,000 quarters from 3,514,000 acres. The yield of 1879 did not probably exceed 7,000,000 quarters. The crop of 1891, with every allowance for a wet and cold harvest period, is decidedly superior to 1875 and 1879. Had the acreage remained unchanged from 1872, the crop, instead of being some 8,000,000 quarters smaller than then, would have been 11,840,000 quarters, against 10,110,000 quarters.

SIoux CITY, Iowa, is becoming quite a grain centre. One firm of grain buyers there have handled over 700,000 bushels of wheat during the past year.

CANADA has reason to be happy. Its grain crops this year have turned out well. The yields of wheat, oats and barley are reported to be much above the average of past years.

THE inner kernels of wheat spikelets are always smaller than the outer ones, and they are later in ripening. In establishing any new variety of wheat from cross-breeding, the outer kernels should alone be saved for seed.

THE flaxseed crop for the current year is estimated at 7,500,000 bushels, against 8,750,000 bushels in 1880. The threshing shows a yield of from four to eight bushels per acre, where ten or twelve bushels were anticipated before harvest.

FRANCE appropriates for agriculture this year in round numbers \$780,000. This grant includes agricultural education, expenses for breeding studs and keeping up 2,500 stallions, inspection of woods and forests, and prizes to regional forests.

THE grain available for export from Austro-Hungary this year has been estimated in value at 100,000,000 florins. This is with one exception the largest on record. Excessive rains during the last few weeks have, however, entirely destroyed the crops in the districts of Laibach and Carinthia, and damaged them in many other places.

ACCORDING to the last report of the Commissioner of Agriculture it appears that 7,600,000 persons in the United States are engaged in agricultural pursuits. The total value of farms and farm implements is \$18,461,203,438, or two thirds of the productive wealth of the nation.

No Chinese farmer ever sows a seed of grain before it has been soaked in liquid manure diluted with water, and has begun to germinate; and experience has taught him that this operation not only tends to promote the growth, and development of the plant but also to protect the seeds from the insects hidden in the ground.

A GRAIN of wheat never produced a grain of chess, or "cheat," as farmers persist in calling it. These two plants, wheat and chess, belong to different varieties of the grass family, the chess being a bromus (*B. secalinus*), the wheat a Triticum. As well might we grow an apple tree from a plum pit as chess from wheat, and a careful study of the two plants will show us why we often find chess where we have sown only wheat.

THERE are twenty immense glucose factories in this country. Already a capital of over \$2,000,000 is invested in the business. The daily consumption of corn for the manufacture of glucose is about 85,000 bushels, and the annual amount about 11,000,000. All these factories have sprung up in the last twelve years.

THE Secretary of the Illinois State Board of Agriculture in his latest report, in regard to the wheat crop, concludes as follows: The 1881 wheat crop in point of yield is the smallest on record during the past twenty-one years, and it is doubtful if the quality has ever graded as low. The causes affecting the crop have heretofore been stated to be the severe protracted winter—

the drouth in many sections of the state and the unusual number of chinch bugs which have damaged the crop in nearly every wheat county in the state. The wheat crop (spring and winter) for 1881 is only 22,374,186 bushels, against 56,508,303 bushels last year, a decrease of 34,134,146 bushels as compared with the previous year. If the same wheat acreage is seeded for the next crop as for the crop just harvested there will still be a surplus from the 1881 crop, after deducting the quantity of seed and consumption for the coming year, of over six millions (6,002,883) bushels, to say nothing of the large supply of old wheat still in first hands. The rye crop was the largest ever produced in the state. The oat crop was the largest ever produced except in 1875.

The English Movement Against Free Trade.

THE very strong sentiment against Free Trade which is now rapidly growing in England is finding expression in vigorously written pamphlets that are being printed and distributed there by tradesmen and others who feel that they are being hurt and who have the sense to know what it is that hurts them. Mr. Henry Carey Baird, of Philadelphia, has recently received a copy of one of these pamphlets, entitled *Official Agricultural Returns for Twelve Years, from 1869 to 1880*, containing very strong English arguments against Free Trade, which, however, are more local than general in their application, and are chiefly valuable to our Protective cause from the fact that they are put forth by Englishmen and are directed against English Free Trade. Valuable statistics are printed in the pamphlet to show how English Agriculture has been effected by Free Trade from which we take the following statement, setting forth the rapid growth of the imports of farm produce by Great Britain in the past twelve years:

Year.	Farm produce imported.	Three years' average.
1869.....	£ 69,968,313	
1870.....	54,805,629	
1871.....	67,266,115	
1872.....	76,253,903	
1873.....	83,028,134	80,870,757
1874.....	83,330,233	
1875.....	89,046,917	
1876.....	91,230,671	94,182,725
1877.....	102,310,238	
1878.....	10,187,719	
1879.....	103,513,931	106,350,952
1880.....	114,351,667	

Observations on Improving Mill-Seats.

[Extract from Oliver Evans' "Mill-wright Guide," published in 1840.]

I may end this part with a few observations on improving mill-seats. The improvement of a mill seat at a great expense is an undertaking worthy of mature deliberation, as wrong steps may increase at 10 per centum, and the improvement be incomplete; whereas, right steps may reduce it 10 per centum and render them perfect.

Strange as it may appear, it is yet a real fact, that those who have least experience in the milling business, frequently build the best and most complete mills. The reasons are evident—

The professional man is bound to old systems, and relies on his own judgment in laying all his plans; whereas, the inexperienced man, being conscious of his deficiency, is perfectly free from all prejudice, and is disposed to call on all his experienced friends, and to collect all the improvements that are extant.

A merchant who knows but little of the miller's art, or of the structure or mechanism of mills, is naturally led to the following steps, namely:

He calls several of the most experienced millers and mill-wrights, to view these separately, and point out the spot for the mill-house, dam, etc., and notes their reasonings. The first, perhaps, fixes on a pretty level spot for the mill-house, and a certain rock, that nature seems to have prepared to support the breast of the dam, an easy place to dig the race, mill-seat, etc.

The second passes by these places without noticing them; explores the stream to the boundary line; fixes on another place, the only one he thinks appointed by nature for building a lasting dam, the foundation a solid rock, that cannot be undermined by the tumbling water; fixing on a rugged spot for the seat of the house; assigning for his reasons, that the whole fall must be taken in, that all may be right at a future day. He is then informed of the opinion of the other, against which he gives substantial reasons.

The mill-wright, carpenter, and mason, who are to undertake the building, are now called together to view the seat, fix on the spot for the house, dam, &c. After their opinion and reasons are heard, they are informed of the opinions and reasons of the others; all are joined together, and the places are fixed on. They are then desired to make out a complete draught of the plan for the house, &c., and to spare no pains but to alter and improve on paper, till all appear to meet right, in the simplest and most convenient manner, (a week may be thus well spent,) making out complete bills of every piece of

timber, the quantity of boards, stone, lime, &c., a bill of iron work the number of wheels, their diameters, number of cogs, &c., &c., and everything else required in the whole work. Each person can then make out his charge, and the costs can be very nearly counted. Every species of materials may be contracted for, to be delivered in due time; the work then goes on regularly without disappointment; and when done, the improvements are complete, and a considerable sum of money saved.

Gratiot's New System of Gradual Reduction.

There is certainly a practical limit to the percentage of flour which can be extracted from a given quantity of wheat, but invention, it is asserted, has not yet reached that limit. The latest device for the purpose is that of Gratiot, who claims from eighty to eighty-five per cent of "patent," and about five to eight per cent. of "low grade" attainable in every case by his system.

Gratiot's, in contradistinction to many other systems, makes only three breaks on wheat. The first reduction, made on a vertical roller mill of peculiar construction, takes out few middlings and no flour, but it is said to work efficiently in thoroughly removing the germ and the seam impurities. This machine is so arranged that the wheat is broken as it enters the upper part, the germ and seam impurities being thoroughly scoured away in the lower longer portion of the machine, where it undergoes a sufficiently extended operation. This is a distinctive feature said to be found in no other system.

The second break, also, takes out no flour, but all middlings.

The third break produces about one-third flour and two-thirds middlings; while the bran machine, also of special construction, gives about one-third middlings and two-thirds low-grade flour.

The germs removed in this process are noticeably whole, no broken particles being found among the middlings.

The middlings produced are said to be very sharp and regular; and Gratiot asserts that his machine will grind these middlings better than any burr mill extant.

Now, if the system will do what is claimed for it, and it should, as it makes nothing but the finest middlings, 60 per cent. of the finest patent flour is not an improbable claim. At the rate claimed, to make 125 to 150 barrels of such flour per day, it will require only three machines to reduce the wheat, one to clean the bran and two to grind middlings—a notable economy in plant at the outset.

A heavy stock company is forming for the manufacture of these machines, which will be ready for the trade in a few weeks. Meanwhile, those interested can address the Gratiot Manufacturing Company, 79 Dearborn Street, Chicago.

St. Louis Elevators and their Capacities.

	Capacity for Bulk Grain.
St. Louis.....	2,000,000
East St. Louis.....	900,000
Venice.....	450,000
Central "A".....	700,000
Central "B".....	900,000
St. Louis Warehouse.....	200,000
Advance.....	500,000
Union.....	750,000
Northern.....	500,000

Total Capacity.....6,900,000

The St. Louis Grain Elevator Company is building a new elevator which will adjoin the East St. Louis Elevator and be known as East St. Louis "B." The new elevator will have a capacity of 900,000 bushels, and will be pushed forward to completion as rapidly as possible.

The Union Elevator Company has a capacity in Union Elevator of 750,000 bushels. In constructing the elevator the machinery was so arranged that a capacity of 1,500,000 bushels could be had. The company propose building at once such additions as will give it that amount of storage room.

The Advance Elevator Company is building a new elevator which will have a capacity of 1,000,000 bushels. It will be known as Advance "B," and will be connected with Advance "A." This new building will be completed by the latter part of December.

The Missouri Pacific Elevator, now in course of construction, will have a capacity of 800,000 bushels. When all the above mentioned new elevators are completed, St. Louis will have a total capacity for storing bulk grain of 10,350,000 bushels.—*Grain Review*, (St. Louis.)

"La, me," sighed Mrs. Partington, "here I've been suffering the bigamies of death for three mortal weeks. First I was seized with bleeding phrenology of the left hemisphere of the brain, which was exceeded by a stoppage of the left ventilator of the heart. This gave me an inflammation of the bowels, and now I'm sick with the cloveform marasmus. There is no blessing like that of health, especially when you're sick."

SECRET CIPHERS.

A SYSTEM TO CHEAPEN OCEAN TELEGRAPHY AND INCREASE SECURITY.

Cable rates to England are now 25 cents a word, but they have been as high as \$100 for a ten-word message. Notwithstanding the great reductions that have been made in the cost of ocean telegraphy since the Atlantic cables were first laid, rates to points in Asia or to South America run up to several dollars a word. There are houses whose business requires frequent telegraphic communication with such distant points, and methods of obtaining brevity of expression are hence of very great value. Telegraph code-makers supply such methods.

"Code-making as a business has grown up within the last five or six years," says J. C. Hartfield, who makes it a specialty. "It has the advantages of both economy and secrecy. The use of codes for ordinary business purposes dates from the beginning of ocean telegraphy, but people at first got up their own codes. It is a very easy thing to do apparently. All you have to do is to make a list of phrases which you have frequently to use in your business and represent them by a corresponding list of single words. But people found that words are apt to be changed in telegraphic transmission into words whose telegraphic notation is similar. The result has sometimes been disastrous. Code-makers make avoidance of such liability to error a special study. Then, too, code-makers can attain a condensation of expressions that makes their work far cheaper than any simple code such as a business man might get up for himself. Hence, large houses are willing to pay well for having codes made for them. There are houses spending as much as \$30,000 a year for telegraphic advices, and a system which will put their messages into few words effects a very great saving for them. I have made a combination code for one house here by which the entire state of the Japanese tea market can be put into seven words. These seven words will convey to them the dates of steamers sailing, the state of the market for nine grades of tea, the rates of freight by six routes, the amount of purchases for Europe and the United States, the grades upon which the demand is running, the principal buyers, rates of exchange, the number of packages sent in the day's shipments, and the points to which they are consigned. I have made a code by which the amount of sales of flour, butter and cheese, the state of market for each, and the amount of money paid into bank are sent daily to a house in this city by its branch at Liverpool, the whole message being put into two words."

"Can codes be gotten up for the use of any house in the same line of business, or do houses prefer to have their own special codes?"

"Large houses prefer to have their own codes. One large banking house for whom I prepared a code had a printing establishment set up inside the bank building so as to make certain of receiving all the copies of the code that were printed. Some of the codes used by large houses are very voluminous. Brown Brothers & Co. have a code of 64,000 words; Thomas & Co., 67,000; Moske Bros. 60,000; Drexel, Morgan & Co., about 45,000 words. We have to ransack all languages to get so many words which shall all be telegraphically dissimilar."

"How much do codes cost?"

"From \$30 to \$6,000, according to the amount of labor required."

"Are secret ciphers used to any extent in telegraphing?"

"Some stock operators make use of cryptograms, and get them up themselves. A method used a good deal is to have a simple code, in which the words denoting the phrases to be conveyed are numbered, and simply the numerals are sent. Such a code can be used so as to conceal messages from a person getting hold of the code, for numerals may be sent which only the person will understand to differ by a certain amount from the numerals denoting the phrases really conveyed. I knew one in use in which the rule was to add the date of the month to the numerals of messages from a branch house. Thus, if the figure five came on the 20th, they would look for the meaning of 25 in the code book. The use of codes and ciphers is very large, but the use of the highly-condensed codes, where not only words but their combinations convey means, is not so wide as would be expected from its great economy. It takes some time and trouble to learn to use such codes with facility, and this retards their introduction, but they are coming more and more into use every year."

Code-makers keep the details of their work secret but the principal upon which codes are constructed is easily understood. The range of all staple business transactions has limits, and as a rule, closely confined limits. The aim of the code maker is to classify phrases which shall

express the constantly recurring details of the market for any staple, and to denote each of its phases by a word. Another object is to use one word so as to convey several meanings. This is done by arranging market details above the tops of columns of words and prices, quantities or any other information along the side. A word in the table expresses the phrase at the top of its column, and also the phrase at its side. The compilation of a code is a very laborious task, but its value as an aid to business communications is indisputable.

Sometimes queer sentences result from the chance grouping of code words. Not long since a tea house got this: "Unboiled babies detested."—*New York Sun*.

The Second Suez Canal Project.

The *Levant Herald* has the following concerning the project for constructing a second canal through the isthmus of Suez: "Startling as the idea may at first seem, it will appear less so on further examination; and it is by no means clear that such an enterprise would not be as profitable to the promoters as it would be beneficial to the commerce of the world. At all events, the subject is worthy of consideration, and, if found feasible, at the present, when money is plentiful and the shares of the existing canal company are at a premium of nearly 400 per cent., would strike one as opportune for launching such a scheme. Its promoters would have many advantages over those who, twenty-three years ago, joined with M. de Lesseps in his great and, as it then appeared, financially speaking, hazardous undertaking. They would, in the first place, have no political obstacles thrown in their way. They would, in the next, be able to obtain their capital on far easier terms than their predecessors, of whose experience they would reap all the benefit and advantage. Added to these favorable circumstances, they would turn to account all the improvements of modern machinery. In this way an enormous saving, both in time and money, might be effected. The advantage to commerce of a second canal can hardly be disputed. The delays and stoppages in the existing canal are a serious obstacle and source of trouble, even with the present amount of traffic. In another seven years (by which time the new canal might be completed) it will be incalculably worse."

Steam Wagons.

The *Colusa Sun* says: "After all his experiments, Captain Roberts, of the San Joaquin Company, is still an enthusiast about his steam wagon enterprise. We had a conversation with him some time ago, and he thinks that roads suitable for his wagon can be built very cheaply. While the wagons run and pull very heavy loads on common roads, he thinks of digging two small graded ditches and filling with gravel, which will pack as hard as iron, and give a solid road for each of the broad wheels, and for the wagon wheels that follow with the loads. The *Chico Enterprise* has an item to the effect that this steam wagon has been thoroughly overhauled and improved at the Union Iron Works, Sacramento, and on a recent trial worked satisfactorily. Its weight is 16 or 18 tons, and it is calculated to haul 50 tons of grain at each trip. It will be taken to the Upper Sacramento valley in a day or two, and will engage in grain hauling between Riceville and McIntosh's Landing."

"Capt. Roberts will, if this one shall prove the success he anticipates, put on wagons to run to all the principal landings on the river, and thus cross-section the entire Sacramento valley from foothill to river, every eight or ten miles. We sincerely hope that the wagons may prove successful, as it would be one of the grandest things for the Sacramento valley that could be imagined; that is, always provided we can keep the river navigation from being destroyed."

River Transportation Companies.

As intimated in our September issue, the consolidation of the Mississippi Valley and the St. Louis and New Orleans Transportation Company is an accomplished fact, the corporate name of the new combination being the St. Louis and Mississippi Valley Transportation Co., officers as follows:

President, Henry C. Haarstick; Vice-President, Henry Lourey; Secretary, Henry P. Wyman; Treasurer, Austin R. Moore. The equipment of the company consists of thirteen tow boats, ninety-eight first class barges, together with floating and stationary grain elevators at Cairo, Belmont and New Orleans. With an ample stage of water, allowing 23 days for the round trip, the companies can now carry to New Orleans very nearly four millions of bushels of grain per month, while it is an easy matter, on account of its immense capital, to increase its

tonnage proportionate to the demands of our rapidly increasing commerce. The company can, with an assured depth of channel and a large movement, transport grain to New Orleans, a distance of nearly 1,300 miles by water, at the rate of four cents per bushel.

In addition to the above named Company, we note the American Transportation Company, capacity 500,000 bushels, and the Mound City Transportation Co., capacity 500,000 bushels, giving us a total monthly barge tonnage aggregating four millions bushels of grain.—*Grain Review* (St. Louis.)

Items of Interest.

ACCORDING to the census report during the census year of 1879-80 the iron mines of the United States produced 7,006,417 tons of ore, of which Pennsylvania contributed 2,173,415 tons; Michigan, 1,834,712; New York, 1,239,959; New Jersey, 799,545; and Ohio, 604,241 tons. There are 801 iron mines in the United States, which Professor Pumpelly, of the Census Bureau, estimates as being capable of an output of 18,365,233 tons annually.

A BUSHEL of corn makes four gallons of whiskey. Certain distilleries in Peoria, Ill., make 54,160 gallons in one day, consuming 13,540 bushels of corn. To grow that day's supply of the grain requires 310 acres, yielding an average of 50 bushels to an acre.

The old style miller who to-day mounts his husk-frame and bids defiance to the spirit of improvement that is everywhere asserting itself, presents a picture similar to that of a certain somewhat verdant antediluvian defying the floods. Before he knows it he will be surrounded by the great wave of progress and struggling to get astride the ridge-pole of the gradual reduction ark.—*Grain Cleaner*.

A New York company has tendered a casket of sheet bronze with gold trimmings in which to place President Garfield's remains, and it has been accepted. A crypt will probably be erected in Lake View cemetery, in which the casket will be exposed to view.

Funnygrats.

Little Lottie to her friend: "I have so many cares. Yesterday a little baby sister arrived and papa is on a journey. It was such a piece of luck that mamma was at home to take care of it."

A chap being asked to explain a paradox or how it was possible for a lazy man to attain so much education, answered: "I didn't attain it, I—just—heard—it—here—and—there, and was too lazy to forget it."

Tourist: "Where is Block Island?" Polite American: "In Rhode Island." Tourist: "But how can you put one island in another island?" Polite American: "G, that's nothing—we accomplish anything in this country."

An officer of the union army relates that upon one occasion after a charge upon the enemy's works, a fierce encounter and a fall back for re-enforcement, a bright young Irish soldier was found to have a rebel flag captured from the foe. Approaching him he said—"I'll send that to the rear as one of our trophies; give me the flag." "Sure, I'll not give it to ye," said Pat; "if ye are wanting one, there's plenty av 'em behind that ridge over beyond where I got this; sure ye can go and get one for yerself."—*Boston Commercial Bulletin*.

A solemn looking man recently walked into the office of the *Petaluma Paving*, and handed a paper over to the advertising clerk and said: "I will pay you your top advertising rates to have that printed in your 'Answers to Correspondents' column every other week during the summer." The advertisement read:

"Amateur Sailor—The quickest way to bail out a boat while sailing is to pull out the plug in the bottom."

"I'm afraid we can't do it," said the clerk regretfully, upon which the solemn party folded up the paper and walked out with a deep sigh.

"Who is that?" asked the editor, looking up.

"It's the new coroner."—*San Francisco Post*.

A New York girl married a Zulu prince. However, if the prince retains his native costume, she will have the best of most girls who marry foreign title. The Monday's washing will be lighter.

Instead of complaining that the rose has thorns I congratulate myself that the thorn is surmounted by roses.

"Smith," said Brown, "there's a fortune in that mine!" "I know," said Smith, "I've put my fortune in it."

The Chicago Board of Trade to Mr. Handy, of Cincinnati: "Och! och! Let me up; take a man of your size!"

There must be something wrong about the family government when a four-year-old boy is overheard praying: "O Lord, take all the naughty out of Johnny, and all the scold out of papa, and all the punish out of mamma. Amen." No doubt the little fellow fell asleep after that in a blissful confidence that life was going to be brighter for him.

"BEST IN THE WORLD."

GARDEN CITY

WHEAT BRUSH!



Gathmann's patent "inclined bristles" prevents all clogging when the brushes are run close together. This is the

ONLY DOUBLE BRUSH

Which can be set up close so that it will

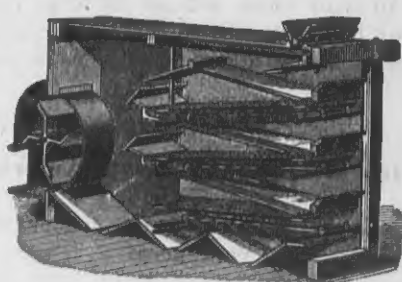
Thoroughly Brush Wheat.

It don't break or scratch the grain. Removes all the dust. Very light running. Send for circular and prices.

GARDEN CITY

MIDDLINGS

PURIFIER!



Travelling Cloth Cleaners.

Our improved Purifier has every device requisite to make it perfect, and every one in use is giving the greatest satisfaction to the users. The Cloth Cleaners are guaranteed to clean the cloth better than is done on any other purifier. Send for our new circular.

We are agents for the

BODMER

BOLTING CLOTH,

Which has long been acknowledged as the best made, and which has lately been further improved, making it now beyond competition. We make it up in the best style at short notice. Send for prices and samples.

Garden City Mill Furnishing Company,
CHICAGO, ILL.

[Mention this paper when you write us.]

Dust Explosions.

The recent violent explosion of dust in the malt elevator of one of the largest breweries in New York, calls for special mention, since it is a source of danger that is frequently overlooked, or very much underrated. There are so many manufacturing processes in operation which involve the production of combustible substances in highly comminuted form, capable, unless great precautions are taken to prevent it, of causing violent and disastrous explosions, that the real extent of the danger from this form of accident should be intelligently understood by all. It should be understood that the dust of such combustible substances as coal or grain, when mixed with air, in which it will float, is a dangerous explosive. It is only necessary, in this connection, to recall several notable cases of disastrous accidents happening from this cause, to impress the fact upon every mind. Of these we need only call to mind the explosion and burning of the Washburn, Diamond, & Humboldt Flouring Mills in Minneapolis, which occurred on the 21 day of May, 1878, and which at the time attracted universal attention from its peculiar character and disastrous effects.

These mills were destroyed by the explosion of particles of flour and bran mixed with air, and the violence of the explosion was so great that brick walls six feet thick were thrown down, and portions of the iron roof of one of the mills were thrown upward with such force that they were carried away by the wind to a distance of several miles from the scene of disaster.

There seems to be good reason to believe, in the light of the frequent accidents of this kind that have lately been noticed, that many mysterious explosions and conflagrations may have been caused by the accidental ignition of mixtures of combustible dust and air. This is undoubtedly true of many of the explosions that occur in collieries, and which have been in many cases erroneously attributed to the presence of "fire damp." Of manufacturing establishments, flouring and grinding mills and breweries are the most exposed to this form of accident, and the utmost precaution should be exercised to avoid them that intelligent supervision can devise. In some cases, however, no amount of precaution can avail to avert accidents of this kind, since a pebble or bit of iron, finding its way between the stones or steel grinders, will cause a spark which would, according to circumstances, cause a flash or an explosion in the highly combustible mixture in the exhaust flue. Accidents from these very trifling causes are simply unavoidable, and the fact that such danger is constantly present, should be known and understood.

It may be remarked in connection with the brewery explosion mentioned at the outset of this article, that a similar explosion of malt dust had taken place in the same establishment about a year previously, caused by the accidental pressure of a lucifer match among the malt, which was ignited in the malt mill. A number of a similar character are reported to have occurred in two other breweries in this city, and it is probable that they are of common occurrence.

Respecting the character of these and similar dust explosions, Prof. L. W. Peck, who made a careful study of the subject immediately after the notable destruction of the Minneapolis flouring mills, gives the following very practical illustration, which occurs in a lecture delivered on the subject: "If a large log of wood were ignited, it might be a week before it would be entirely consumed. Split it up into cordwood and pile it up loosely, and it would burn in two hours. Split it up into kindling wood, pile it up loosely, and perhaps it would burn in less than one hour. Cut it into shavings and allow a strong wind to throw them in the air, or in any way keep the chips comparatively well separated from each other, and the log would perhaps be consumed in two or three minutes; or, finally, grind it up into a fine dust or powder, blow it in such a manner that each particle is surrounded by air, and it would burn in less than a second."

This illustration explains very clearly why mixtures of combustible dust and air are highly explosive, and therefore specially dangerous. The combustible material is in a very fine state of division and intimately mixed with the supporter of combustion, and the ignition of one set of particles being accomplished, the combustion is carried at once through the entire mass with explosive violence, as though it were an explosive gaseous mixture.—*Manufacturer and Builder.*

The new grist mill at Dallas, Wis., is being built by James Anderson.

Pesth Milling Industry.

Pappenheim's Oesterr.-Ungarische Zeitung says, "the shares of the Buda-Pesth steam mills are going back from day to day, as there are more sellers than buyers in the market. The unremunerative state of the flour trade justifies the retrogression of the shares to a certain extent; the prices of grain have, after the harvest, been driven up so high that the export in grain to foreign markets is quite impossible, and the export in flour is also either not at all possible, or only at prices which leave no profit to the manufacturer. It is clear, however, that the number and power of production of our steam mills, is too large for the demand, and, therefore, at the time when the export of flour is not profitable the situation of our mills becomes rather precarious. The continually increasing American competition gives, with regard to our milling industry, for the future also an unfavorable outlook. In the present year the manufacture is more expensive because Rumania has a bad crop, and the cheap Wallachian wheats, which, during the last few years, played a great part in our markets, and which procured for our mills a cheap and easy supply, are almost wanting. It is lucky for our mills that they have accumulated large reserves, so that they are in a position to get over the unfavorable present state of the trade without endangering their existence."

The Cost of Water-Power.

In connection with the recent decision of the Water-Power Company of Holyoke, Mass., to demand payment for all of its surplus water used by the mills, late estimates of the relative cost of water and steam power are of interest. H. F. Mills, engineer of the Water-Power Company of Lawrence, Mass., testified in suits of that company against the city of Boston that \$12 per day for water privilege was cheaper for the mills at Lawrence than to start their engines and use steam power. It is estimated from actual comparison at Lawrence, where great quantities of power are used, that a horse-power produced by steam would cost about \$50 per year more than a horse-power produced by water. At Minneapolis, Minn., the cost of a mill privilege is only about \$2.50 per day or \$750 per year. The theoretical power of a privilege is seventy-five horse-power. This gives a capacity of 185 barrels of flour per day. The cost per barrel at this rate is a little less than two cents per barrel, being a great saving upon the cost of grinding by steam power.

For the United States Miller.

The Tariff.

"COMING EVENTS CAST THEIR SHADOWS BEFORE."

By John W. Hinton, of Milwaukee.

It is very gratifying to every American protectionist to witness the change that is taking place in the minds of many of the leading democrats of the country on the question of protection to American industry, i. e., giving to American labor a preference over foreign labor. Notably there are two instances, Senator Pendleton and that prominent war horse of the democracy, Daniel Voorhees. The latter is a gentleman of singular ability, of remarkable power and eloquence and of commanding influence, particularly with his party, of which he has for so long a time been an able champion.

It is not for us to say that those two gentle-

men are influenced by any but the most upright motives, or that they are guided by other aims than their country's good. Patriotism often moves in a mysterious way its wonders to perform. Messrs. Pendleton and Voorhees have no doubt seen wherein they were wrong, and, having seen it, are candidly correcting their errors.

"True patriots we, and be it understood, We left our party for our country's good."

Senator Conkling, in his able speech at Utica last fall, on the Tariff, in referring to the first act of Congress ever passed, alluding to the broad patriotism that moved the statesmen of those days, describing the unanimity with which they acted, quoted the distich:

"Then all were for the country,
And none were for the state;
Then the rich man loved the poor man,
And the poor man loved the great."

Parties forgot their lines, they realized that in union there was strength; that when the deepest of all interests to the country, that which could alone develop its resources, build it up through its own industries, to a state of independence of other countries; that to bring about as rapidly as possible that most desirable position it was necessary to forget party squabbles, to harmonize party differences and to act in concert for the promotion of so great an interest. Hence, republicans and democrats unitedly worked in harmony and brought about the passage of the first act of Congress "to encourage American manufactures, etc."

Now what right have we to question the motives of such men as Senators Pendleton and Voorhees in their recent action? Are men to be abused for a change of belief? Are they to be denounced for having the candor and the manliness to admit that they were mistaken in the past—to acknowledge that "they are wiser to-day than they were yesterday?" To denounce such men, to accuse them of mercenary motives because they say to their former opponents, you were right and we were wrong—is to be guilty of sycophantic cowardice. Have not those gentlemen a right to review their former opinions, to test their wisdom or their folly, to determine the right or the wrong of their former beliefs? There can only be an affirmative answer to the questions. A fool, it is said, never changes his mind or his opinions; wise men often change. Do we wish to deny to our political opponents the right of confirming the correctness of our views by furnishing to the world publicly, the evidence of their own mistaken ones, and that voluntarily? Yet that is about the course that is being pursued by a great many republican journals (?) in their attacks, particularly on Senator Voorhees, especially for his speech at the Atlanta Exposition! If what was said by Senator Voorhees at that opening was true, and no real republican or advocate of protection to American industries and American labor can deny it, for it was only the doctrine that protectionists have been enunciating ever since the government was founded, why attack it? Refute it they cannot, then why attack it? Are there republicans who are afraid that such men as Pendleton and Voorhees may reclaim the workingmen to their party? Are they afraid that such gentlemen will steal their thunder? Do they realize that the course of several so-called republican journals is alienating the working classes from the republican ranks? These are thoughts worthy of the consideration of your readers, and I embody them solely for that purpose, as I am a republican in and out and believe in the doctrine of protection to American labor "first, last, and all the time."

NEWS.

Everybody Reads This.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

BURNED.—Peter Louck's mill, at Bowman-dale, Pa.

The Zumbro mills, at Zumbro Falls, Minn., burned recently.

James Deubel has purchased the Costello mill at Scio, Mich.

Lewis Korb is about to erect a flouring mill at Sobres City, Ky.

DIED.—Alexander Anderson the miller at Valley Field, Quebec.

David Gates has purchased Elias Gray's flour mill at Osseo, Wis.

W. J. Wallace has sold his mill at Stanville, Texas, to M. P. Wallace.

BURNED.—Abel Godard's flour mills at Richville, N. Y. Loss 21,000.

The new Parker Flouring mills, at Parker, Dakota, will have a capacity of 150 barrels per day.

J. Hoyt & Son's mill at Saline, Mich., burned recently. Loss \$5,000. Insurance \$1,000.

A supposed incendiary fire recently destroyed the Rose City Flour Mills, at Little Rock, Ark. Loss \$65,000.

Charles Eseman & Co's flour mill, in Chicago, was recently damaged by fire. Loss about \$3,500.

A new water power flouring mill outfit is being manufactured for Mr. Jervis Gordon, of Milford, Pa.

Messrs. Wilson & Smith have purchased the mill at East Brady, Clarion County, Pa., and are having it remodeled.

Lindsay Bros., of Rapid City, Dak., have given an order to Nordyke & Marmon Co., for a two-run water power flouring mill.

The Oconto Milling Co., at Oconto, Wis., has just made \$12,000 worth of improvements. They have added Stevens' rolls, purifiers, etc.

E. C. Hoyt, of Beaver Dam, Wis., whose flour mill was recently burned, will, with others, soon build a cotton mill at Beaver Dam.

The heavy rains during October did much damage to water-power mills in many parts of the country, especially in the northwestern states.

The Lake Flouring Mills at Reno, Nev., burned recently. Loss \$38,000. Insurance \$25,000. They will be rebuilt as soon as possible.

A four-run new process flouring mill is now being built at Georgetown, Ill., the proprietors of which are Messrs. Pritchard, Henderson & Co.

The Menonites in Manitoba were blessed with a first-class crop this year. They know how to raise wheat, and how to stack it so that it will keep.

Messrs. Notbohm Bros., of Junesville, Wis., are planning the construction of a cotton mill at that place. Their flour mill was burned a few months ago.

The Jewell Milling Co., of Brooklyn, N. Y., have recently ordered from Edward P. Allis & Co., seven corrugated roller mills and seven porcelain roller mills.

The Portage Lake Mining Gazette says: "The only grist-mill on Lake Superior is at Sault Ste. Marie, which is credited with turning out excellent flour."

Gaff, Gent & Thomas, of Columbia, Ind., have just placed another order for an 80 horse power Corliss engine, with the Atlas Engine Works, of Indianapolis, Ind.

The Atlas Engine Works, of Indianapolis, Ind., have been awarded the first premium with gold medal, for the valve engine on exhibition at the Ninth Cincinnati Industrial Exposition.

Nordyke & Marmon Co., the mill furnishers at Indianapolis, Ind., are manufacturing a merchant mill outfit, having a capacity of 50 barrels per day, for Messrs. Still & Nethaway, of Elsie, Mich.

Messrs. Weisel & Vilter, proprietors of the Milwaukee Steam Engine Works report business to be exceedingly good and there are now no visible signs of its abatement. They are crowded with work to their full capacity and will doubtless soon be compelled to enlarge their establishment. They are adding new machinery as fast as it is possible to get it from the manufacturers. They have now

FLOUR MILL OWNERS!

Please answer this advertisement BY LETTER. Do not delay but answer it at once. It will take but a moment and you will thereby serve the trade as well as yourself. It cannot but prove of value to you.

Flour Mill Owners in the United States and Canada

GENTLEMEN: We are preparing the matter for CAWKER'S AMERICAN FLOUR MILL DIRECTORY for 1882 and would beg you to kindly furnish us by return mail with the following information:

1. The name of person or firm operating your mill, with name of your Post-Office, County and State.
2. Capacity in BARRELS of flour, of mill per day, of 24 hours. (If you are making improvements and increasing capacity, state what the capacity of your mill will be after your improvements are made.)
3. Do you use water or steam power?
4. If you have any special name for your mill, as, for instance, "Phoenix," "Oriental," "Capital," "Wild Moss," etc., please name it.
5. Are there any other flour mill owners receiving their mail at your Post-office? If so, kindly oblige us by naming ALL of them.

Upon receiving above information we shall duly insert your names with Post-office in our Flour Mill Directory. The Directory is used by the mill-furnishers, flour brokers, commission merchants and trade newspapers in this country and in Europe for the purpose of sending out their circulars, price lists, catalogues and sample papers, which will furnish you with much valuable information, which without your names in this Directory you would not obtain. If you are not already a subscriber to the UNITED STATES MILLER we invite you to subscribe. The subscription price is One Dollar a year. We desire to have the UNITED STATES MILLER a regular visitor in every flour mill in America. Do not fail to answer this advertisement immediately whether you subscribe or not. We want this, our Third Flour Mill Directory, to be as perfect as possible, therefore make your answer full and complete. We wish it distinctly understood that we make no charge for inserting your name in the Directory. ADDRESS:

UNITED STATES MILLER, Milwaukee, Wis.

E. P. Bacon & Co.,

Rooms 27 and 28 Chamber of Commerce,

MILWAUKEE.**L. Everingham & Co.,**

No. 130 LaSalle Street,

CHICAGO.**COMMISSION MERCHANTS!****GRAIN, SEEDS, PROVISIONS, ETC.****Special Attention given to the Purchase and Shipment of Grain for Milling Purposes.**

We have an experienced man in attendance at each elevator constantly, to see to the inspection of grain when loaded into cars for shipment, and the interests of parties ordering through us will be carefully protected in every way.

Orders for Purchase and Sale of Grain for Future Delivery will be Promptly and Carefully Executed.

Mention this paper when you write us.]

in hand eight Corliss engines and several others of various types of slide valve engines and any quantity of other work for millers, brewers, tanners, etc.

George Leggate, formerly of Fletcher, Ohio, has purchased a water power mill site at Milton, Ind., near Richmond, Ind., and has contracted for the machinery for a four-run new process flouring mill.

The Atlas Engine Works, of Indianapolis, Ind., are building two Corliss engines of 100 and 150 horse power for the C., St. P., M. & O. R. R. They are to be placed in their new shops at St. Paul, Minn.

J. R. Evans, formerly of Hersey, Mich., has associated himself with William Burtless, of Midland, Mich., and they will embark in the milling business at the latter place. A first-class three-run new process flouring mill will be built.

The new narrow gauge railroad having been completed to Liberty Center, Ind., the erection of a first-class flour mill will be commenced at that point at once. This enterprise is undertaken by Mr. G. H. King, an old resident of that place.

The International Cotton Exposition at Atlanta, Ga., is attracting a great deal of attention from all parts of the country. The Atlas Engine Works, of Indianapolis, Ind., have just shipped four engines to be placed on exhibition.

A new grain elevator, called "Niagara B," with a capacity of 1,250,000 bushels, has just been completed in Buffalo, N. Y. It is the largest one in Buffalo. The dimensions are as follows: 200 feet long, 120 feet wide and 145 feet high. It is covered with corrugated iron.

Tin has been discovered in great quantities near Pomona, Cal. The yield at present price is assayed at about \$90 per ton. It is to be hoped that the supply will prove sufficient to meet the large and continually increasing demand for the metal, for which we have been in the past obliged to depend on Great Britain.

Bonsack & Kiser, who suffered the loss by fire of their flouring mill at Bonsack, Va., last summer, have now completed arrangements for its re-erection, and have awarded their contract for a first-class new process merchant mill to Nordyke & Marmon Co., of Indianapolis, Ind.

The Atlas Engine Works, of Indianapolis, Ind., are putting in at the present time Corliss engines as follows: 20x48 for J. M. Stewart & Co., Carlyle, Ill.; 18x42 (condensing) for T. M. Sinclair & Co., Cedar Rapids, Iowa; 18x42 New Orleans Electric Light Co.; 19x42 Indianapolis Electric Light Co.; and a 18x42 for Batty Bros. & Boynton, Waverly, Ill.

A gold medal was recently awarded to the W. D. Gray Roller Mills at the Exhibition at Montreal, Canada, the mill on Exhibition being one of 40 now being built for Messrs. A. Ogilvie & Co., by Edw. P. Allis & Co., of Milwaukee, for their new mill at Winnipeg, Manitoba. Messrs. Miller Bros. & Mitchell are the sole manufacturers of the Gray Roller mills for Canada.

Messrs. Hatch & Mitchell, well known millers of Lowell, Mich., have about completed the necessary arrangements for the erection of a fine 150 barrel gradual reduction mill at Grand Rapids, Mich. A large brick building is being erected, and the entire outfit of machinery is being manufactured by Nordyke & Marmon Co., of Indianapolis, Ind. The reductions will be made on Jonathan Mills' machines, the finishing will be

done with smooth and corrugated rolls, while the middlings will be ground on stones.

Flour sells for \$10 per barrel in Boston.

N. Hoople is building a grist-mill at Sauk Center, Minn.

Strickler Bros. are building a 100-barrel mill at Pickerington, Ohio.

No. 2 winter wheat is selling at interior points in Missouri at \$1.25 per bushel.

The George T. Smith Middlings Purifier Co. will build a 1,000-barrel mill at Jackson, Mich. Eau Claire, Wis., flour mills had to shut down most of October, on account of floods.

Burned, October 21, Maj. Edgar Henderson's flouring mill, at Anderson, Ind. Loss \$12,000; well insured.

The Indianapolis Mills at Indianapolis, Ind., were totally destroyed by fire on Saturday. Loss, \$28,000; insured for \$30,465.

A distillery building at Hazelton, Ind., containing 7,000 bushels of wheat, burned October 21. The Atlantic Mills narrowly escaped burning.

Brown & Archer, of Greenville, Miss., are building a new mill for the manufacture of corn meal flour, or cerealine, and other corn goods. A complete apparatus for kiln drying the goods before shipment will form a part of the outfit. All the machinery, including engine, comes from the mill furnishing establishment of Nordyke & Marmon Co., of Indianapolis, Ind.

J. P. Blanton, who has a neat 50-barrel steam power flour mill at Forest City, Ark., writes us from that place that there has been very short crops in that section—only about a quarter crop of wheat was expected of both corn and cotton. The demand for flour is good and it sells for from \$8 to \$10 per barrel. But little wheat was sown last fall.

W. Trow and W. H. Powell, Madison, Ind., having formed a co-partnership under the style of W. Trow & Co., for the purpose of carrying on a merchant milling business, announce that their new mill, now in course of erection, and which is being fitted up with the most improved machinery, will be in operation about January 1. They invite the orders of the trade.

The new Queen Bee Rolling Mill at Sioux Falls, Dakota, owned and controlled by the Sioux Fall Water Power Company, has just been completed. It is said to contain the finest machinery, and is one of the largest mills in the United States. It is seven stories high, built of Sioux quartzite, and has a capacity of 1,500 barrels per day. The cost of these mills is put down at nearly \$500,000. George I. Seney, of Brooklyn, N. Y., is interested in the mills, being the largest stockholder, and Henry P. Reed, of the same city, has been engaged as salesman for the market west of Chicago, Ill.

The Wilmington, Del., *Every Evening* says that William Lea & Sons' immense new flouring mill, on the north side of the Brandywine is rapidly approaching completion, and is to be in operation about the latter part of December. The building of this mill marks a new era in the flouring business in Delaware. It is a very large four story and attic structure, and the proprietors have availed themselves of the very latest improvements in mill machinery. Nearly the whole machinery of the new mill is designed for the manufacture of high grade flour. There are five runs of stones driven by water power. The rest of the machinery is to be driven by steam. Through an opening on the creek side elevators will deliver flour into or convey grain from vessels moored alongside the mill.

Situation Wanted,

Either in Merchant or Custom Mill—Merchant preferred. Have had two years experience in Custom Mill. Wages not so much an object as learning the trade. Address "M. C.," care United States Miller, Milwaukee, Wis.

I Want to Rent

The whole or half of my Mill at this place. It is a water-power mill, in good condition, with capacity of about 25 barrels per day. No other mill in the township. Address for further particulars,

WILLIAM REDDEN,
Greeley, Delaware County, Iowa.

MILL FOR SALE.

Enon Valley Mills, with three run of stones in good running order on the Pittsburgh & Fort Wayne R. R. Shipping facilities good. Address

MILLER & MARSHALL,
Enon Valley, Lawrence Co., Pa.

Wanted to Rent or Buy

A half interest in a two or three run Custom Mill, water-power preferred, in a good agricultural locality.

Address by letter, with particulars, B. H. S.
Post Office Box No. 51, Gananoque, Leeds Co., Ontario, Canada.

WANTED TO BUY,

A small Mill in a good wheat country. Address
D. F. HESS,
Dennison, Tuscarawas Co., Ohio.

FOR SALE

We, the undersigned, offer for sale on most favorable terms our Custom, Flouring and Oat Meal Mills, located at Geneva, Walworth County, Wisconsin, together with an unfailing water power from Geneva Lake. All said mills are now in full repair and good working order. Said water power is in complete order and is at all times easily managed and controlled. These mills have a large custom work. The reason for this is the health of a proprietor.

GILBERT & BARBER, Proprietors,
Geneva, Walworth County, Wis.

IMPORTANT NOTICE TO MILLERS

The RICHMOND MILL WORKS, and RICHMOND MILL FURNISHING WORKS are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to

NORDYKE & MARMON CO.,
INDIANAPOLIS, IND.

CHOICE BEVELED EDGE**FLOUR BRANDS**

For two dollars and upwards. Also RUBBER STAMPS, BURNING BRANDS, SEALS, STEEL NAME STAMPS, LETTERS AND FIGURES, Etc. Orders promptly attended to.

CHAS. H. CLARKE,
Box 114, 82 Wisconsin St., Milwaukee.

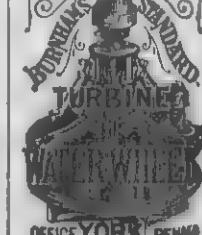
FOR SALE

A good water power and mill with two run of stone at Stone Bank, Waukesha County, Wis. Mill is doing a good business, which with a moderate amount of improvements, could be largely increased. One half or the whole will be sold to the right party. For full particulars, address,

U. S. MILLER, Milwaukee, Wis.



[Mention this paper when you write us.]

Over 1,000 of these Turbines IN USE.

It has tight shutting and easily operated Gate; gives more power for the water used, and will last longer than any other Turbine. Large shop with improved tools for making this wheel and machinery. Illustrated Pamphlet and Catalogue with prices sent free by

N. F. BURNHAM.

[Please mention this paper when you write us.]

"THE MILLER."

A MONTHLY JOURNAL, published at London, England, devoted to the interest of Millers. For the convenience of Millers in this country, we will receive and forward subscriptions for all who wish. The subscription price is \$1.50 per year, post paid. Address

UNITED STATES MILLER,

Milwaukee, Wisconsin.

1865. 1881.

C. A. FOLSOM & SON,

Manufacturers of the Purest and Best

Lubricating and Burning OILS, GREASES, ETC.,

For Flour Mill Machinery, Specialties.

MILLERS'**Castor Machinery Oil.**

A compound oil, warranted better than Lard or Sperm Oil for machinery uses, and will last longer. Guaranteed not to heat or gum, and to give satisfaction when used on steps, spindles, etc.

MILLERS' LAMP OIL.

Warranted free from Petroleum. Burns equal to Lard or Sperm Oil. Will not chill at 32° above zero, and much cheaper than Lard Oil.

Globe A, Natural W, Virginia Rock Oil, A perfectly natural Oil, just as it comes from the earth. Thoroughly settled and refined of high fire test, and will not congeal at zero. It is the best Black oil produced.

Peerless Mill Soap,

A compound Grease for use on cogs and all heavy gearing. Put up in kegs, half barrels and barrels.

CAPITOL CYLINDER OIL,

Manufactured for Steam Cylinders, especially for use in Patent Lubricators. Warranted not to foam, heat or gum, and endorsed by manufacturers of Corliss Engines.

We also have all grades of Sperm and Golden Machinery Oil, Lard, Engine, and several grades of Cylinder and Black Oils, Plumbago, Cotton Waste, etc., etc., which we will offer at prices that defy competition, when quality is considered. Orders and correspondence solicited.

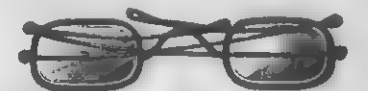
C. A. FOLSOM & SON,

130 West Water St., Milwaukee, Wis.

[Mention this paper when you write to us.]

MAX. HAUSER,

(Brother of Adolph Hauser, the Jeweler.)



PRACTICAL OPTICIAN (Late of Vienna),

469 EAST WATER ST., MILWAUKEE, WIS. Keeps a large stock of Spectacles, Eye, Opera and Marine Glasses, Microscopes, Telescopes, Barometers, Thermometers, and pays special care to a scientific adjustment of all kinds of glasses to the eye. Any of the above glasses made to order and repaired.

Blanks, by means of which parties residing in the interior of the State may order spectacles as suitable as if they had personally selected them, will be mailed free on application.

Millers in need of magnifying glasses for any purpose can have their wants supplied at a reasonable price. Address as above.

[Mention this paper when you write to us.]

STEEL CAR PUSHER

Made entirely of STEEL. ONE MAN with it can easily move a loaded car. Will not slip on ice or grease.

Manufactured by E. P. DWIGHT, Dealer in Railroad Supplies, 407 Library St., Philadelphia, Pa.

[Mention this paper when you write us.]

HOPE for the DEAF.

Dr. Peck's Artificial Ear Drums

PERFECTLY RESTORE THE HEARING and perform the work of the Natural Drum. Always in position, but invisible to others. All conversation, and even whispers heard distinctly. We refer to those using them. Send for descriptive circular and testimonials. Address, H. P. K. PECK & CO., 853 Broadway, New York.

GARFIELD

An elegant pair of Companion Oil Chromes—size 6x11 inches. Life-like portraits of the late President and his devoted wife.

Price \$1.00 for the Pair.

Sent prepaid by mail on receipt of price. Liberal discount to Agents and Dealers.

CALVERT LITHOGRAPHING CO.,

Detroit, Michigan

COCKLE SEPARATOR MANUFACTURING COMPANY,

General Mill Furnishers

AND MANUFACTURERS OF
IMPROVED COCKLE SEPARATORS,
(Kurth's Patent),
RICHARDSON'S DUSTLESS WHEAT
SEPARATORS.

Also built in combination with Cockle
Machine and

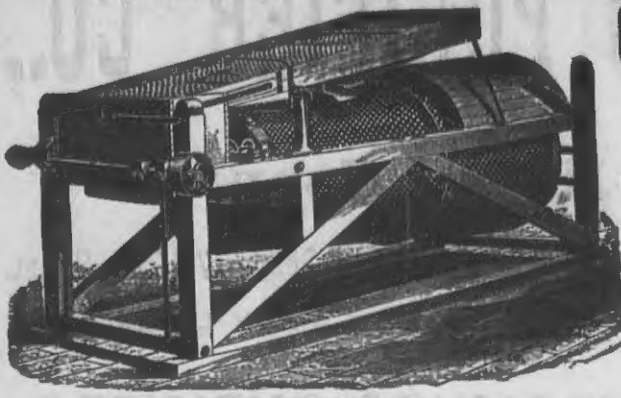
Beardslee's Pat. Grain Cleaner.

We will contract to furnish entire Wheat Cleaning
Machinery for mills and guarantee the best results.

Perforated Zinc at Bottom Figures.

Send for Illustrated Catalogue.

COCKLE SEPARATOR MFG. COMPANY, Milwaukee, Wis.



PLAIN COCKLE MACHINE.

[Mention this paper when you write.]



BEARDSLEE'S WHEAT CLEANER.

EUREKA MANUFACTURING CO.,

Manufacturers and Sole Proprietors of the

BECKER BRUSH,

Galt's Combined Smut and Brush Machine.

The Only Practical Cone-Shaped Machines in the Market, and for that
Reason the Best.

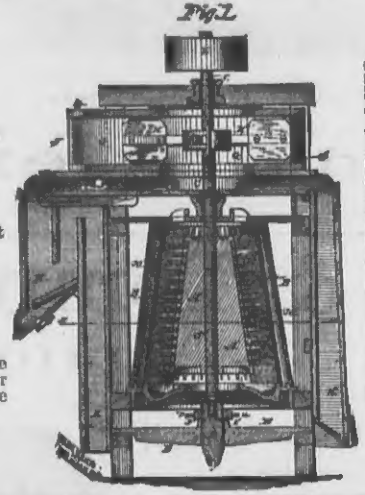
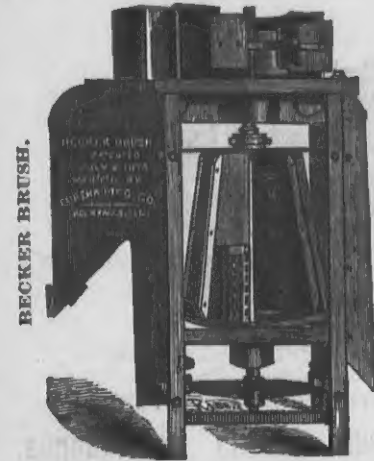
ADJUSTABLE WHILE IN MOTION.

Nearly 1,000 of these Machines in Use.

In the United States and foreign countries, and so far as we know all that use them are
pleased. Millers, millwrights, and milling experts claim the Cone Shape Solid Cylinder
Brush is the true principle to properly clean grain. All machines sent on trial, the
users to be the judges of the work. For price and terms apply to

EUREKA MAN'G CO., ROCK FALLS, ILL., U. S. A.

[Mention this paper when you write.]



Galt's Combined Smut and Brush Machine.



MANUFACTURERS OF
Circular Saw Mills, Shafting, Pulleys,
Hangers & General Mill Machinery,
Selling Particulars of Steam, &c.
Address: T. C. ALCOTT & SON,
Mount Holly, N. J.

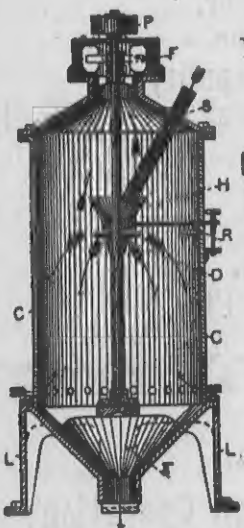
[Mention this paper when you write us.]



Mill Furnishing,
Foundrymen & Machinists.
Established 1861.
MANUFACTURE
MILL STONES.
Flouring Mill Contractors.
Send for Pamphlet.
Hordyke & Harmon Co
Indianapolis, Ind.

[Mention this paper when you write us.]

Millers, Attention!



You can successfully purify the chop from either
Stone or Rolls with the

Wheat Meal Purifier.

Satisfaction Guaranteed or No Sale.

THIRTY DAYS' TRIAL.

Send for circular and full particulars to

Wheat Meal Purifier Co.,

Academy of Music, MINNEAPOLIS, MINN.

[Mention this paper when you write us.]

ESTABLISHED 1877.



THE HOWE

Mill Elevator Cups.

NEAT, STRONG, DURABLE and CHEAP.

FIN.			IRON.		
BELT.	END.	PRICE.	BELT.	END.	PRICE.
2 1/2	2 1/2	8 Cents.	4 1/2	4 1/2	7 Cents
3	3	8 1/2 "	5	5	7 1/2 "
3 1/2	3 1/2	9 "	5 1/2	5 1/2	8 "
4	4	9 1/2 "	6	6	8 1/2 "
4 1/2	4 1/2	10 "	6 1/2	6 1/2	9 "

GEORGE W. WHITE & CO.,

257 Twenty-Ninth St., CHICAGO, ILL.

[Mention this paper when you write us.]

THORNBURGH & GLESSNER,

Successors to N. Hawkins & Co. and Charles & Swenson.



47 AND 49 WEST LAKE STREET, CHICAGO, ILL.

MANUFACTURERS OF AND DEALERS IN

Elevating and Conveying Machinery.

Elevator Buckets, Elevator Boots, Elevator Bolts, Patent Iron Conveyor, Belting Cloth, Pulleys,
Hangers, Shafting, Journal Boxes, etc., etc.

H. W. LYMAN & CO.,

MANUFACTURERS OF

**Malleable & Gray
Iron Castings**

OF ANY KIND OR DESCRIPTION,

PORT WASHINGTON, WIS., U. S. A.

[Please mention this paper when you write us.]

**STEEL
CASTINGS**

Works, CHESTER, PA.

[Mention this paper when you write us.]

FROM 1-4 to 10,000 LBS. WEIGHT.

True to pattern, sound and solid, of unequalled strength, toughness and
durability.
An invaluable substitute for forgings or cast iron requiring threefold
strength.
Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for Loco-
motives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove
its superiority over all other steel castings.
CRANK SHAFTS, CROSS-HEADS and GEARING, specialties.
Circulars and price list free. Address

CHESTER STEEL CASTINGS CO.,
407 LIBERTY ST., PHILADELPHIA, U. S. A.

BOTTLED BEER.

VOECHTING, SHAPE & CO.,

SOLE BOTTLEERS OF

JOSEPH SCHLITZ BREWING COMPANY'S

CELEBRATED MILWAUKEE LAGER BEER,

Cor. Second and Galena Streets,

MILWAUKEE, WISCONSIN.

BOTTLEERS' SUPPLIES CONSTANTLY ON HAND.

[Parties corresponding will please state where they saw this advertisement.]

Abernathy's New Book.

PRACTICAL HINTS

Mill Building.

The Latest, Best and Only Exclusively
Flour Mill Work in Print.

Every Miller, Millwright and Millwright's Apprentice
should have a copy.

Price \$4.00, postage paid. Address,

UNITED STATES MILLER,
Milwaukee, Wis.

HENRY HERZER,

Manufacturer

and

Dresser

-OF-



MILL PICKS!

NO. 466 ON THE CANAL,

MILWAUKEE, WIS.

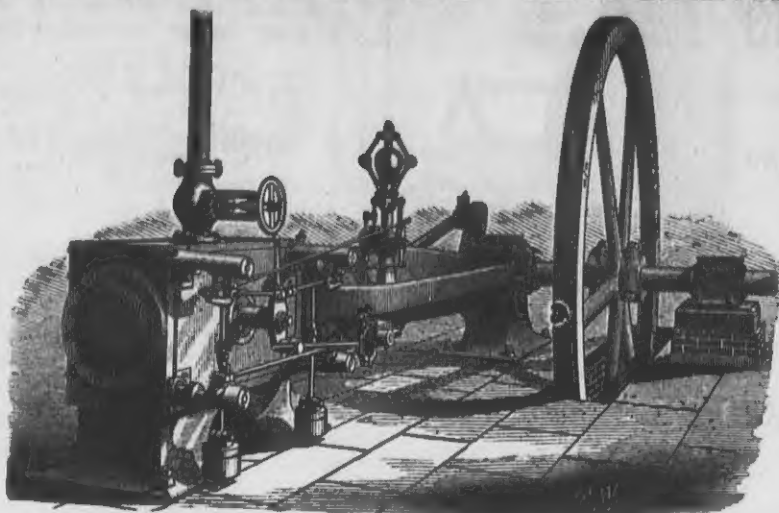
I have had twenty-two years experience in the manu-
facture and dressing of Mill Picks, and can and do make
as fine Mill Picks as can be made by anybody anywhere.
I use only the best imported Steel for the purpose.
My work is known by millers throughout the country,
and is pronounced to be first class by the very best
judges.
We have hundreds of the most gratifying testimonials
from nearly all the States. We solicit your orders and
guarantee satisfaction. Address as above.
[Please mention this paper when you write.]



Little FLOUR TESTERS mailed for 25c.

ATLAS-CORLISS ENGINE.

Will Replace Ordinary Engines Guaranteeing to Save One Third Fuel.



WRITE FOR ENGINE PAMPHLET.

ATLAS ENGINE WORKS, INDIANAPOLIS INDIANA, U. S. A.

BUILDERS OF ALL CLASSES OF

Engines and Boilers,

We Build The Best Farm Engines and Small Engines for warehouses and elevators.
[Mention this paper when you write us.]

Stout, Mills & Temple,

DAYTON, - - - OHIO.

MANUFACTURERS OF THE

American Turbine Water Wheel,

Best Quality French BURR MILLSTONES.

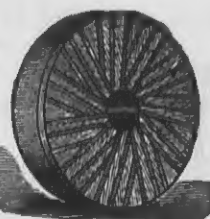
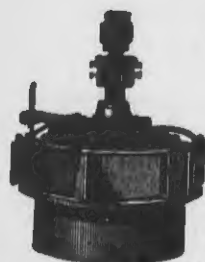
Sole Agents in Dayton for the sale of

DU FOUR & CO'S CELEBRATED BOLTING CLOTHS.

Flour and Paper Mill Machinery, Best Chilled or Porcelain Rolls for Crushing Wheat and Middlings, and

GENERAL MILL FURNISHINGS.

The AMERICAN TURBINE, as recently improved, is unequalled in the power utilized from a given quantity of water, and is decidedly the BEST PART GATE Water Wheel ever known. It has also been otherwise greatly improved.



Large Illustrated Catalogue Sent Free on Application.

[Mention this paper when you write us.]

"THE GREAT ROCK ISLAND ROUTE"

Calls your attention to the following REASONS WHY, if about to make a Journey to the GREAT WEST, you should travel over it:

As nearly absolute safety as is possible to be attained. Fine connections in UNION DEPOTS, at all important points. No change of cars between CHICAGO, KANSAS CITY, LEAVENWORTH, ATCHISON or COUNCIL BLUFFS. Quick journeys because carried on Fast Express Trains. Day cars that are not only artistically decorated, but furnished with seats that admit of ease and comfort. Sleeping cars that permit quiet rest in home-like beds. Dining cars that are used only for eating purposes, and in which the best of meals are served for the reasonable sum of seventy-five cents each. A Journey that furnishes the finest views of the fertile farms and pretty cities of Illinois, Iowa and Missouri, and is afterwards remembered as one of the pleasant incidents of life. You arrive at destination rested, not weary; clean, not dirty; calm, not angry. In brief, you get the maximum of comfort at a minimum of cost.



That the unremitting care of the Chicago, Rock Island & Pacific Railway for the comfort of its patrons is appreciated, is attested by its constantly increasing business, and the fact that it is the favorite route with delegates and visitors to the great assemblages, political, religious, educational and benevolent, that assemble from time to time in the great cities of the United States, as well as tourists who seek the pleasant lines of travel while en route to behold the wonderful scenes of Colorado, the Yellowstone and Yosemite. To accommodate those who desire to visit Colorado for health, pleasure or business, in the most auspicious time of the year, the summer season and months of September and October, the Company every year puts on sale, May 1st, at all coupon ticket offices in the United States and Canada, round trip tickets to

DENVER, COLORADO SPRINGS and PUEBLO,

At reduced rates, good returning, until October 31st. Also to San Francisco, for parties of ten or more, good for ninety days, at great reduction from regular fares.

REMEMBER, this is the most direct route for all points WEST and SOUTHWEST. For further information, time-tables, maps or folders, call upon or address

R. R. CABLE,

Vice-Prest and Gen'l Man'gr, Chicago.

E. ST. JOHN,

Gen'l Ticket and Pass'r Agent, Chicago.

RICHMOND MANUFACTURING CO.,

LOCKPORT, N. Y.,

Manufacturers of—

RICHMOND'S CELEBRATED

Smut Machines,

Brush Machines,

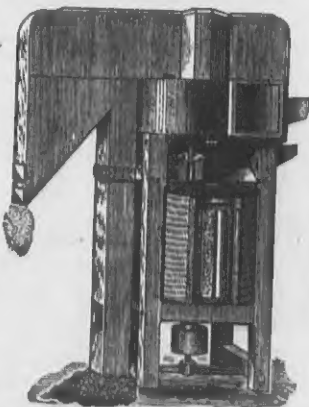
Grain Separators,

and Bran Dusters.

Nearly Two Hundred of these Machines are now in operation in the city of Minneapolis, Minn., alone, and more than Sixty in the city of Milwaukee, Wis. They are also extensively used in many other sections, both on Winter and Spring Wheat.

SEND FOR DESCRIPTIVE CATALOGUE.

[Mention this paper when you write.]



Adjustable Brush Smut Machine.

LOOK AT THIS, MILLERS!

Acme Wheat Steamer and Heater.

PRICE \$15. OVER 900 IN USE.

This is the Cheapest and Best Steamer ever offered. It is strongly made, easily regulated, steams and heats evenly and is sold at a price low enough to place it within the reach of all millers.

READ THE FOLLOWING TESTIMONIALS:

G. W. McNEIL, JR., AKRON, O.: Dear Sir—Yours of 4th inst. at hand, and in reply would say the three steamers purchased of you are working to our entire satisfaction.

G. W. McNEIL, JR.: Dear Sir—The Acme Wheat Steamer is all that it claims to be, steam being better than hot dry pipes to make good clean bran and white flour, Truly,

G. W. McNEIL, JR.: Dear Sir—In answer to your inquiry, would say that I have used your Acme Wheat Steamers and Heaters for the last six months, and it does its work well. I create my steam in a small boiler holding twelve gallons, and heated by three gasoline burners. Yours Truly,

SEND FOR CIRCULARS AND TESTIMONIALS.

GEO. McNEIL Jr., No. 113 North Broadway, Akron, Ohio.

ELECTRIC PURIFIER CO.,

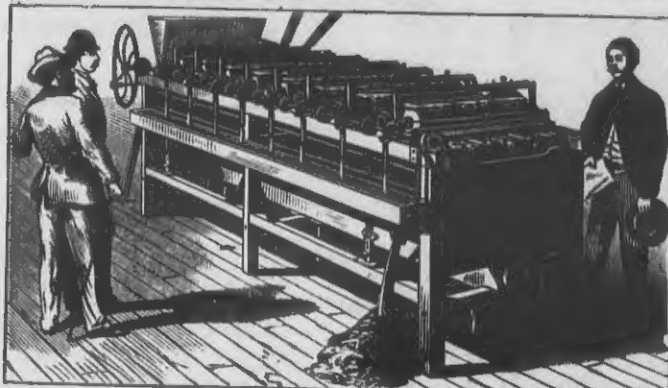
New Haven, Conn.

Factory, New Haven,

New York Office, 17 Moore Street.

This Company was Organized at New Haven on the first of March, 1881, with a Capital of \$300,000.

ELECTRIC MIDDINGS PURIFIERS.



HAVING PURCHASED THE SMITH-OSBORNE PATENTS GRANTED BY THE United States, Great Britain, France, Belgium, Austria and Canada. The first Machine manufactured was put up soon after the United States patent was granted, in February, 1880, in the ATLANTIC MILLS, BROOKLYN, and has been in almost constant practical use since, demonstrating beyond a question that it possesses the following advantages:

- It Purifies Middlings Absolutely Without Waste.
- It Purifies Middlings with Greatly Reduced Power.
- It Purifies Middlings with Greatly Reduced Space.
- It Purifies Middlings with Greatly Increased Rapidity.
- It Purifies Middlings from Spring and Winter Wheat Equally Well.
- It Purifies Middlings with the Best Results.
- It Dispenses with the Use of Air Blasts.
- It Dispenses with the Use of all Dust Houses.
- It Dispenses with the Use of all Dust Collectors.
- It Dispenses with the Dangers of Explosion and Fire.
- IT PURIFIES DUST HOUSE MATERIAL OF ALL KINDS.
- IT PURIFIES THE FINEST MIDDINGS OF ALL KINDS.
- It is Remarkably Adapted to Custom Mills.
- It is Excellently Adapted to Manufacture Farina.

Where the Electric Purifiers May Be Seen in Operation:

Atlantic Mills, Brooklyn, N. Y.; Archibald Schurmeler & Smith, St. Paul, Minn.; F. L. Johnston & Co., St. Louis, Mo.; Washburn, Crosby & Co., Minneapolis, Minn.; Norton & Co., Chicago, Ill.; Sanderson & Co., Milwaukee, Wis.; M. C. Dow & Co., Cleveland, Ohio; James K. Hurin, Cincinnati, Ohio; Mosely & Motley, Rochester, N. Y.; Chas. Tiedman, O'Fallon, Ill.; Lyman & Co., Norfolk, Va.; Texas Star Flour Mills, Galveston, Texas; Zenith Milling Co., Kansas City, Mo.; C. Hoffman & Son, Enterprise, Kansas; Richter & Co., Williamstown, W. Va.; Kinney & Hobart, Burrton, Kansas; Parkville Milling Co., Parkville, Mo.; Norton & Co., Lockport, Ill.; Ballard, Isom & Co., Albany, Oregon; Niedhammer & Walton, Buena Vista, Ind.; Kimberly & Clark Co., Appleton, Wis.; Cyrus Hoffer, Lewisburg, Pa.; Roberts & Briggs, Seneca Falls, New York; Phillips & Thomas, Kennedy, New York; Hillsdale City Mills, Hillsdale, Mich.; Susong, Logan & Co., Bridgeport, Tenn.

SOMETHING NEW!

A Combination Electric Purifier—A Complete System of Three Purifiers in One.

Samples of work will be sent upon application, by mail, and all inquiries answered from the New York office.

Parties contemplating building new mills, or reconstructing old ones, should see the superior working of the ELECTRIC SYSTEM, before making contracts for Purifiers elsewhere.

JOHN RICE,

General Manager.

No. 17 Moore St., NEW YORK.

GUNN, CROSS & CO., MINNEAPOLIS, MINN.,
Manufacturers and Agents for the Northwest.

HARRIS-CORLISS ENGINE.

—BUILT BY—

WM. A. HARRIS, Providence, R. I.

Built under their original patents until their expiration. Improvements since added: "STOP MOTION ON REGULATOR," prevents engine from running away; "SELF-PACKING VALVE STEMS" (two patents), dispenses with four stuffing boxes; "RECESSED VALVE SEATS" prevent the wearing of shoulders on seats, and remedying a troublesome defect in other Corliss Engines; "BABBITT & HARRIS' PISTON PACKING" (two patents). "DRIP COLLECTING DEVICES" (one patent). Also in "General Construction" and "Superior Workmanship."

The BEST and MOST WORKMANLIKE form of the Corliss Engine now in the market, substantially built, of the best materials, and in both Condensing and Non-Condensing forms.

The Condensing Engine will save from 25 to 35 per cent. of fuel, or add a like amount to the power and consume no more fuel. Small parts are made in quantities and inter-changeable, and kept in stock, for the convenience of repairs and to be placed on new work ordered at short notice.

NO OTHER engine builder has authority to state that he can furnish this engine.

The ONLY WORKS where this engine can be obtained are at PROVIDENCE, R. I., no outside parties being licensed.

WM. A. HARRIS, Proprietor.

[Mention this paper when you write us.]

WEGMANN'S PATENT PORCELAIN ROLLS

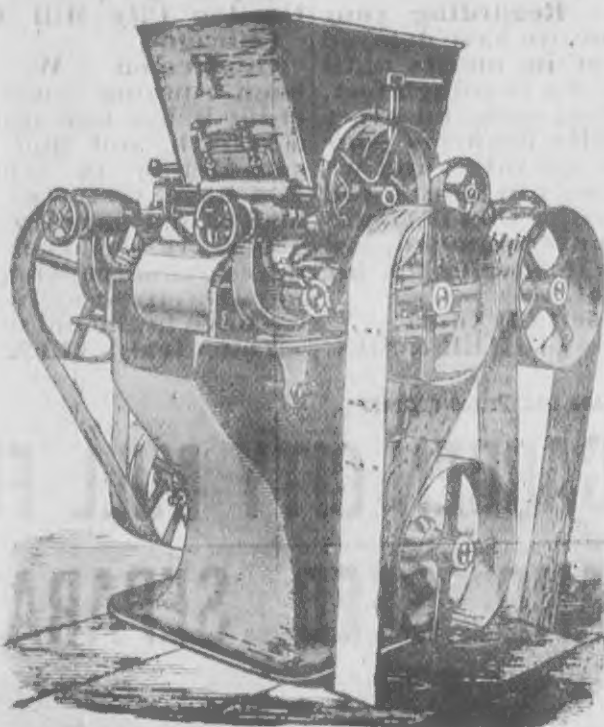
THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!



THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!

"AWARDED SPECIAL PREMIUMS."

OVER 6,000 OF THESE ROLLS IN USE

IN THIS COUNTRY AND EUROPE.

The Superiority of Porcelain over Chilled Iron for Reducing Middlings or Tailings is as under:

CHILLED IRON ROLLS, whether polished at first or scratched with fine grooves, soon become, through wear, smooth and glassy, and will only squeeze instead of grinding.

PORCELAIN presents a continual inherent sharpness, which no art can give to any other material in equal fineness and regularity, which enables it to act upon the smallest particles of flour and to separate them.

CHILLED IRON discolors the flour, by reason of the carbon that exudes from it, and also by its liability to rust.

PORCELAIN does NOT discolor the flour and is entirely indifferent to any and all chemical influences.

CHILLED IRON ROLLS are smooth and "cake" the meal; more especially is this the case on soft material.

PORCELAIN ROLLS possess a certain porosity, and no matter how finely ground, or how long they have been used, still re-

tain this granular and porous texture, and will reduce the middlings without "caking."

CHILLED IRON can be cut with steel.

PORCELAIN can ONLY be cut by the best black diamonds.

CHILLED IRON ROLLS require great power to reduce middlings to the proper fineness on account of their smooth surface.

PORCELAIN ROLLS will do the same amount of work, on account of the slight pressure required, and the gritty nature of the Porcelain, with one-half the power. The flour produced by Porcelain Rolls is sharper, whiter, stronger and more even than that produced by Iron Rolls.

No remarks need be made as to the superiority of Porcelain Rollers over Millstones, as it is a recognized fact by all. Porcelain Rollers are the only Rollers that will entirely supersede Millstones and Metal Rollers.

THESE MACHINES RECEIVED THE FIRST PREMIUM!

At the late Millers' International Exhibition, Cincinnati.

Gold Medals at Nuremberg, 1876; Paris International Exhibition, 1878;

Little International Concours, 1879; First Gold Medal of the State, Berlin International Exhibition of the German Millers' Association, July, 1879; and Gold Medal Le Mans, 1880.

Full Instructions regarding the system of using Rolls in place of Stones given to parties purchasing. Address

EDW. P. ALLIS & CO. Sole Mfr's.

MILWAUKEE, WISCONSIN.

Guaranteed to Improve the Color of Your Flour.

The GARDEN CITY WHEAT BRUSH is so thorough in its work and has been so fully tested that we can safely offer to any customer who has not already learned the value of cleaning wheat without injuring it, that we will show him a **MARKED IMPROVEMENT IN THE COLOR OF HIS FLOUR AFTER PUTTING IN OUR BRUSH.** The following are selected from a large number of very flattering testimonials which we have received:

From the Superintendent of the largest mill in Chicago.

Star and Crescent Mills, }
Chicago, Sept. 26th, 1881. }
Garden City Mill Furn'g Co.:

Gents:—In reply to your inquiry as to how I am pleased with the two GARDEN CITY BRUSH MACHINES which we have had in use for six months in this mill, I will say that there are no words too strong for me to use in their praise. Thorough cleaning of the wheat without injuring the bran, is, in my opinion, much more important than many millers think it is, and this we certainly accomplish with your machines. In fact, I think that the superior whiteness of our flour is due in a large measure, to the use of the Garden City Brush. You do not claim too much for it.

Yours truly,
HENRY FUNCK, Head Miller.

From the Miller who furnishes Flour to the Royal Family of Great Britain.

Cairo City Mills, }
Cairo, Ill., Sept. 19, 1881. }
Garden City Mill Furn'g Co., }
Chicago, Ill.:

Gentlemen—Regarding your Brush Machine, we have delayed our opinion of its merits until we could give it a thorough test, and will say that each and every test made fully confirms your statements of its value, and we have no hesitancy in joining you in same, by saying that it comes fully up to your recommendation, and we consider it invaluable for cleaning wheat.

Respectfully yours,
CHAS. GALIGHER & SON.

See For Circulars and Prices address

From one of the best known Millers in the West.

Victoria Flour Mill Co., Alex. H. Smith, Sec'y, corner of Main and Mound Sts., St. Louis, Sept. 28, 1881.

Garden City Mill Furn'g Co., Chicago:

Gentlemen—We have now been running your Brush Machine in our new mill for about a month, and find it entirely satisfactory in every respect. We have no other scourer or brush, and have no use for any other. It performs the double functions of scouring and brushing as well as any two machines we have in the old mill.

Yours truly, ALEX. H. SMITH.

From the Proprietors of one of the largest mills on the Pacific Coast.

Office of the National Steam Flouring Mills, San Francisco, Cal., March 25, 1881.

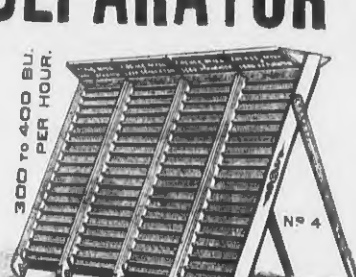
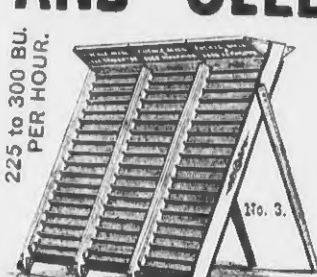
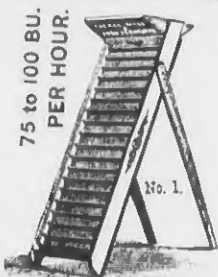
Garden City Mill Furn'g Co.:

Gentlemen—* * * We have the Wheat Brush running, and are well pleased with its working. * * * It took but a few minutes for us to learn that the Wheat Brush is the machine that we have needed for a long time. We think that a large number of the Garden City Wheat Brushes can be sold in this State.

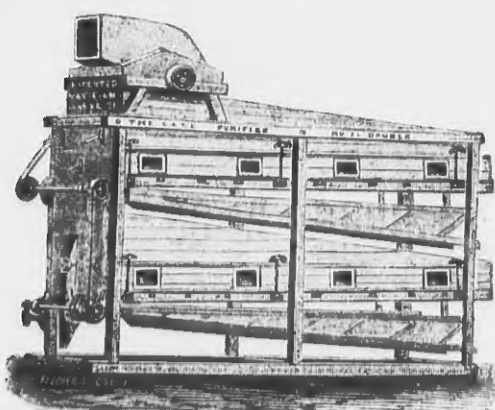
Yours respectfully,
MARTENSTEIN & DEMING.

GARDEN CITY MILL FURN'G CO., Chicago, Ill.

KING COCKLE MILL AND SEED SEPARATOR!



Pat. November 9, 1880. Gives 25 Grades of work by Change of Elevation. No change of Screen. Requires no power. When used in Connection with Kurth Cockle Mill your cleaning capacity is more than Doubled. When used alone you have more Merit for the money than in any device yet invented. Write for circulars to La Du & King, Manufacturers, Rochester, Minnesota.



THE Case Purifier

COSTS LESS AND HAS MORE CAPACITY

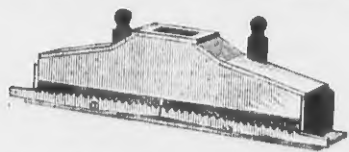
—THAN— ANY in the MARKET.

IT IS THE KING OF PURIFIERS.

ADDRESS, CASE MFG CO., Columbus, O.
WM. E. CATLIN & CO.,
68 LAKE STREET, CHICAGO,
Chicago Agents.

(Mention this paper when you write us.)

The Perfect Feed Box.



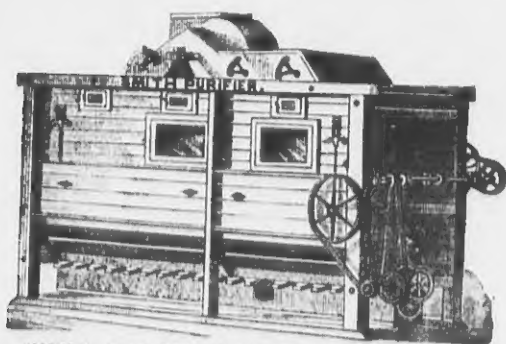
It insures a perfectly even distribution of the middlings over the entire width of the cloth. Every miller will appreciate this. Fits all purifiers. Address,

CASE MANUFACTURING CO.,

COLUMBUS, OHIO.

W. E. CATLIN & CO., 68 LAKE ST., CHICAGO, ILL., AGENTS.

(Please mention this paper when you write us.)



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of EQUAL CAPACITY. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

THE LOCKWOOD MEDAL. Awarded to the Geo. T. Smith Purifier, as the machine making greatest progress and utility in its application to the grain and mill interests, invented within the last ten years. Millers' International Exhibition, Cincinnati, Ohio, 1880.



THE GEO. T. SMITH MIDLINGS PURIFIER

Was awarded **THE HIGHEST PRIZE** ever offered for the competition of milling machinery—**THE LOCKWOOD MEDAL**—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was **UNANIMOUSLY** awarded the **FIRST PREMIUM** in its class by a jury of five of the ablest, most successful and experienced mill-owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated **OVER ONE HUNDRED MACHINES**, for every part of the country and for work on all kinds of stock.

We invite particular attention to our **SPECIAL** machines, combining in one all the features of both air and seive Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich., U. S. A.

[Mention this paper when you write us.]

Northwestern Mill Bucket Manufactory
310, 312, and 314 FLORIDA STREET.



Is furnishing Mills and Elevators in all parts of the country with their superior BUCKETS. They are UNEQUALLED for their SHAPE, STRENGTH and CHEAPNESS.

Leather, Rubber, Canvas Belting and Bolts at lowest market rates. We have no traveling agents. Sample Buckets sent on application. Large orders will receive liberal discounts. Send for sample order. Address all inquiries and orders to L. J. MUELLER, 197 Reed St., Milwaukee, Wis. [Mention this paper when you write us.]

HENRY SMITH, JR. GEO. U. SMITH, F. A. SMITH.

SMITH BROS., Practical Millwrights.

PLANS, SPECIFICATIONS & ESTIMATES

MADE FOR ALL KINDS OF

MILLWORK, MACHINERY, ETC.

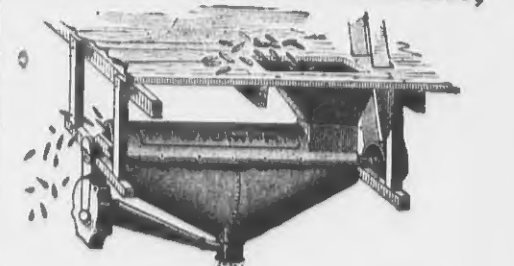
Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

454 CANAL STREET,

MILWAUKEE, WISCONSIN.

[Mention this paper when you write us.]

TRIUMPH POWER CORN SELLER,



Shells and Cleans 2,000 Bushels Kears per Day. The Cheapest, Best, and most Simple Power Corn Seller in use. Send for Circular and Price List.

HULBERT & PAIGE, Painesville, Ohio.

[Mention this paper when you write us.]

Genuine Dutch Anker, DU FOUR & CO'S,

Excelsior Bolting Cloths,

AT IMPORTERS LOWEST PRICES. sold by the piece, or cut and made up in any quantity desired. Plans of bolting complete for stone or roller mills. Address,

C. F. MILLER, Mansfield, Ohio.